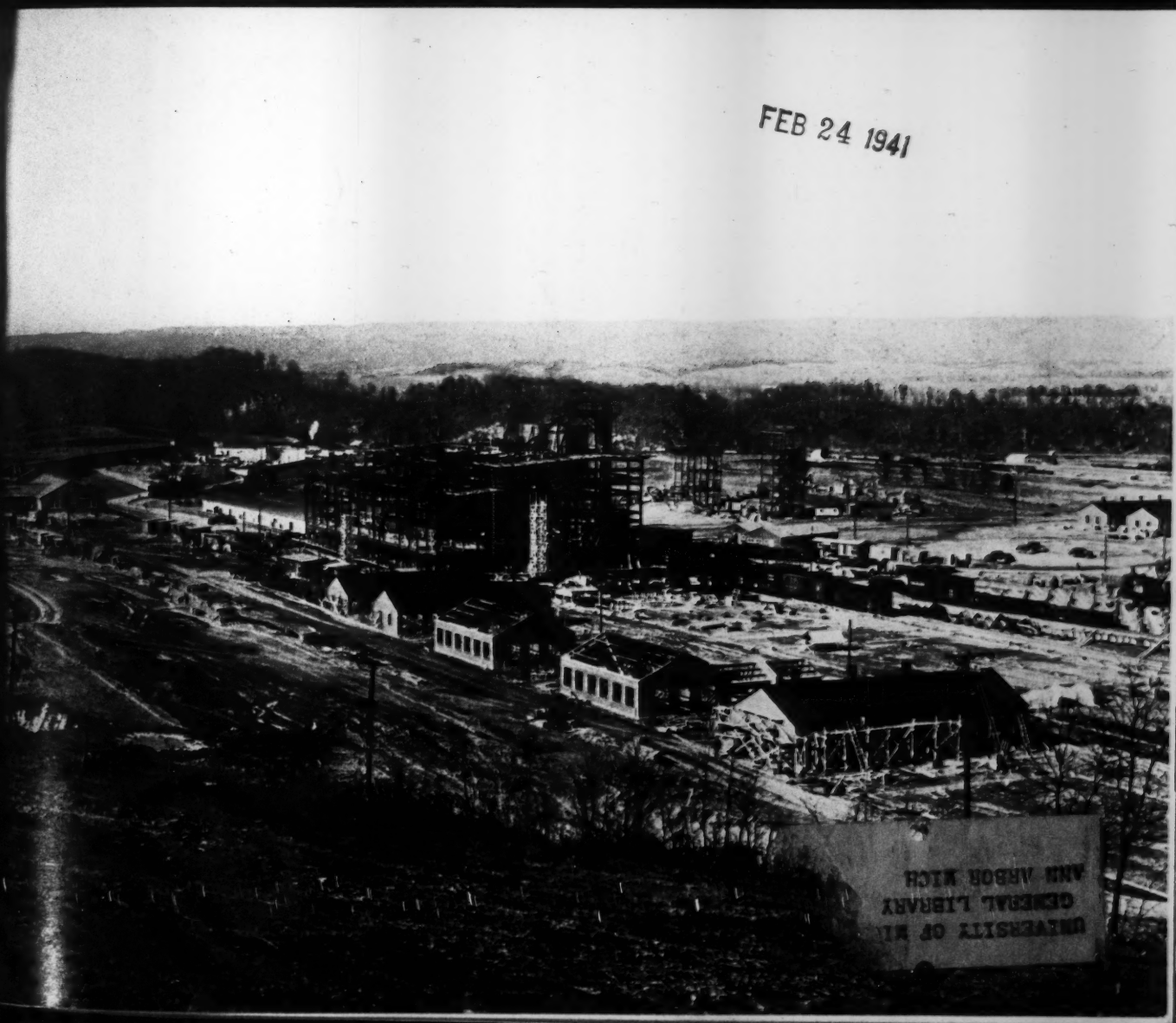
# ENGINEERING NEWS-RECORD

Building for defense as reflected by the Radford powder plant job



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The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • FEBRUARY 20, 1941

# Urgent defense road needs put at $287,000,000

## Federal Works Agency reports to President on immediate needs for camp access roads, tactical roads and the strategic highway network.

Requests for appropriations totalling $287,000,000 for defense-road work and recommendations as to legislation needed to facilitate such work are contained in a report submitted to the President by John M. Carmody, Federal Works Administrator, on Feb. 1 and made public last week. The report, entitled "Highways for National Defense", was prepared by the Public Roads Administration under the direction of Thomas H. Macdonald, and is the result of an elaborate study begun last July.

The following appropriations are recommended: (1) $150,000,000 for immediate construction of access roads to serve military and naval reservations and defense industries; (2) $100,000,000 for immediate strengthening of certain weak sections of the national highway system; (3) $25,000,000 for construction and repair of tactical roads; (4) $12,000,000 for advance planning of post-emergency improvements. Proposed legislation would permit expansion of the federal-aid highway system and would liberalize federal contributions to certain types of road work.

### More speed required

In making these recommendations the Public Roads Administration points out that while a considerable amount of work on defense roads is being done by the states with federal-aid funds where needed work is on the federal-aid system, and other work is being done by the WPA under the liberalized provisions of the Relief Act of 1940, yet because of inherent financial difficulties and legal restrictions, only a part of the needed improvement can be done in this manner. "Many of the larger and most vital projects require contractors' organizations and extensive equipment for time-saving, efficient construction" states the report, "and it is abundantly clear that the funds now available will be inadequate to effect all or even the most urgently required construction."

### Access roads

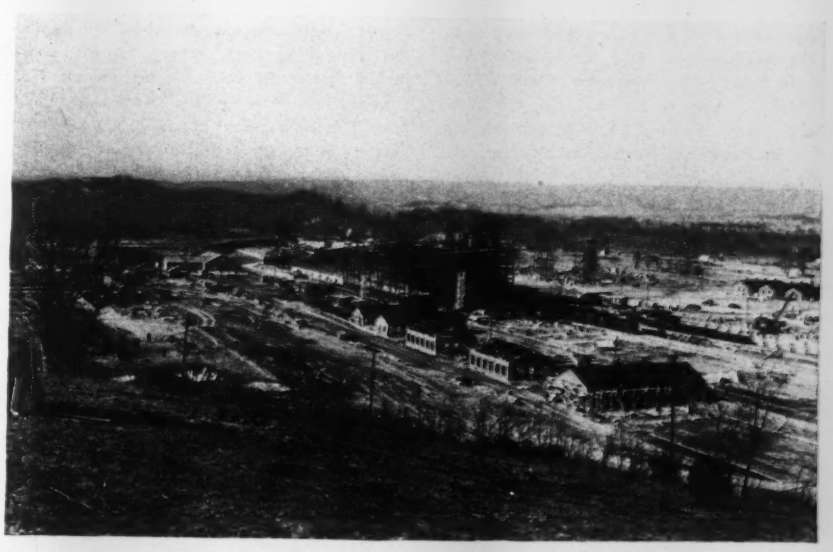
The report states that there should be appropriated to the Public Roads Administration not less than $150,000,000 for access roads to military and naval reservations and defense-industry sites. "This sum should be available to pay all costs, including right-of-way of roads in the vicinity of reservations and industrial sites when such roads are certified to the Federal Works Agency as essential by appropriate major defense agencies. It should also be made available to pay the cost of constructing new sections of highways, replacing existing highway connections broken by necessary closures at reservations and industrial sites."

The report notes that thus far no general provision has been made for payment of the cost of restoring these roads, an omission that leaves an unfair burden on the states.

Required improvements to access roads range from resurfacing and widening two-lane roads to the construction of multiple-lane highways and large bridges.

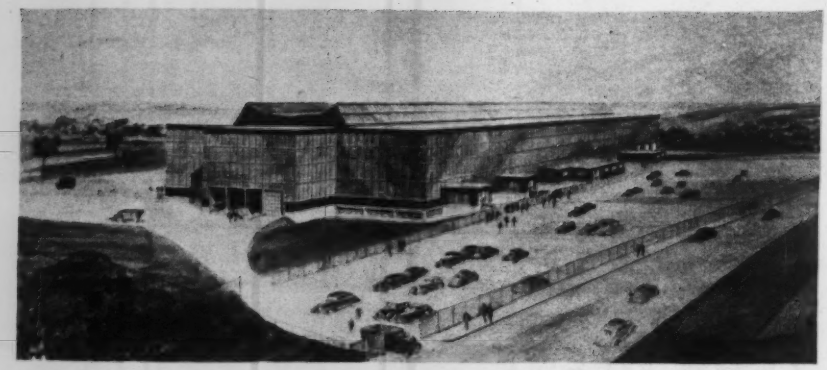
Studies made by the PRA show that 2,830 miles of access roads are required to serve the 192 reservations thus far designated. They will cost $220,000,000. After reservation roads, these access

(*Continued on p. 12*)



## Construction stepped-up at Radford ordnance plant

*The government is spending $36,000,000 on the Radford ordnance plant to meet the munition demands of a fast growing army. This is but one of similar plants now being erected throughout the country under the defense program. This plant is being built and will be operated by Hercules Powder Co., on a contract from the government. Mason & Hanger hold the general construction contract. The large structure is the power plant. Buildings for munitions production, generally, are to be of light steel frame construction covered with corrugated steel or cement-asbestos siding. They are to be spaced well apart as individual structures or small groups to minimize the effect of accidents.*



## Modern industrial plants for defense production

*Typical of the many new industrial plants being erected or planned to meet demands for increased production of national defense equipment are the two plants here illustrated.*

*The new machine tool assembly building for the Bullard Co., Bridgeport, Conn. (shown at top) is being erected at Fairfield, Conn. This building, designed by A. B. Crosett, will be of structural steel frame construction, one story high, and with an area 180x500 ft. This new addition will add approximately two acres of production space to the existing Bullard plant. This project is scheduled for completion July 1, with provision for the beginning of equipment installation June 1. Turner Construction Co., New York City, holds the general contract, having recently completed four other units for the Bullard Co.*

*The Bendix-Westinghouse Automotive Air Brake Company's plant at Elyria, Ohio (shown below) will provide 167,000 sq.ft. of floor space; air conditioned throughout, efficiently lighted and with a minimum of window openings for ease in air raid blackouts.*

## Public works planned to ease defense letdown

The President will soon ask Congress for legislation to aid in carrying out his plan of establishing a large reservoir of public works projects which can be put under way when the armament program begins to slow down. He already has the nucleus of the machinery he will need in the National Resources Planning Board. Under an executive order of last summer (*ENR*, July 11, p. 59) NRPB compiles every year one overall six-year plan of public works—both those to be carried out by federal agencies and those to be done by local agencies with federal loans or grants. The first of these plans will be published in a few weeks, and will give an idea when it comes out of how much work is now ready.

However, the President wants much more than a list of projects. He wants a large volume of jobs set up with congressional action complete and working designs prepared so that construction can start in a matter of days. In the forthcoming plan not many of even the federal projects will be on this basis, while the loan and grant project lists, which would bear the brunt of any sudden expansion of public works, will be very sketchy. Likely, therefore, is legislation providing some arrangement by which small grants could be made at once to local agencies, perhaps under NRPB supervision, to finance design work. This might or might not be accompanied by definite formulation of the loan or grant machinery by which ultimate financing of the actual construction would be arranged. How much design money would be provided is at present pure guesswork. On the assumption, which forms the basis of much current legislation, that the war boom will last about five years, an annual appropriation of $10,000,000 would result in a reservoir of designed projects of some billion dollars. A much larger volume of works than a mere billion is looked for by the fiscal left wing of the New Deal. They are thinking in terms of a program as big as the war effort—ten or twelve billions a year: they are assuming that the armament program will prove their theory of prosperity through spending.

Meanwhile, several of the federal agencies are already going ahead with design work on projects they don't intend to build right away. Some of the others feel they need legislation to permit this. During the present session of Congress, most of the departments will probably ask authorization bills, either approving specific projects or authorizing general design work. Highways present a special case. The President lays particular stress on express roads as a desirable type of project for the reservoir. But before any substantial amount of design can be done, a procedure under which they can be built and financed must be worked out—perhaps as federal projects, perhaps under the plan of loans to states and municipalities which was in the Senate draft of last year's highway bill. So far, no agreement on these points has been reached, and it will probably be late in the session before a bill is introduced.

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## No priority in use of Colorado River water

The Attorney General of Texas in an opinion to the state board of water engineers, recently held that there is no priority, as between the Lower and Upper Colorado River Authority in the use of the waters of the river.

The U. S. Bureau of Reclamation had requested an official ruling from the attorney general on the question. The Lower Colorado River Authority has developed its system of dams, but that part of the river coming under the jurisdiction of the Upper Colorado River Authority remains undeveloped, although development has been authorized by law.

Both river authorities, the opinion stated, have rights subordinate to the public use of the waters for irrigation and municipalities.

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# Contracts for Atlantic defense bases total nearly $35,000,000

***Army and Navy let contracts for additional work on bases in Trinidad, British Guiana, St. Lucia, Antigua, Bermuda and Newfoundland***

Contracts totaling $34,618,000 for work on Atlantic bases were let last week by the Army and Navy. The Army, which had previously awarded design contracts for garrison work at these bases announced contracts totaling $13,706,000, which will be expanded to $102,280,000 as soon as Congress provides the money. The present contracts are financed from the President's emergency fund. The Navy, which awarded one construction contract at Newfoundland some time ago, increased the amount of that contract by $9,425,000, and let another of $11,487,000.

#### Work in Trinidad

For aviation facilities at the naval air stations in Trinidad and British Guiana the Bureau of Yards and Docks of the Navy let a contract jointly to James Stewart & Co., H. J. Deutschbein Co. and Peter F. Connolly Co., all of New York, on a cost-plus-fixed-fee basis. The estimated cost, including fee, is $11,487,000. For work on its base at Trinidad the Army let an initial contract of $5,190,000 to the George F. Driscoll Co., Brooklyn, and the Walsh Construction Co. of Davenport, Iowa, for work estimated to cost $51,000,000 ultimately. For work in British Guiana, the Elmhurst Contracting Co., Long Island City, received a contract of $900,000 to start work costing $3,000,000.

Other contracts for Army work in the British West Indies went to the Minder Construction Corp., Chicago, $900,000, for start of work on a base at St. Lucia to cost $3,000,000; and to S. J. Groves & Sons Co., Minneapolis, $900,000, to start work on a $2,880,000 base at Antigua.

#### Bermuda base

The Army let an initial contract of $2,456,000 for work on a $19,000,000 base in Bermuda to the Arthur A. Johnson Corp., Long Island City; Necaro Co., Brooklyn; and Vermilya-Brown Co., Inc., New York.

#### Added work in Newfoundland

The Navy let a second contract for work on the base at Argentia, Newfoundland, to the George A. Fuller Co., and Merritt-Chapman & Scott Corp., New York. It is for aviation facilities estimated to cost $9,425,000. The Army's initial contract of $3,360,000 on its $23,400,000 defense base in Newfoundland went to a combination of Al Johnson Construction Co., Minneapolis, Nick F. Helmers, Inc., New York, McWilliams Dredging Co., Chicago, and A. Guthrie & Co., St. Paul.

Fay, Spofford & Thorndike, Boston, are engineers for the Army on the Newfoundland work, and Shreve, Lamb & Harmon, New York, are architects. The Navy so far has done its own engineering work.

Engineering and architectural work for the Army at Trinidad, Antiqua and British Guiana is being done by Caribbean Architects-Engineers, New York, a combination of Parsons, Klapp, Brinckerhoff & Douglas, engineers, and Voorhees, Walker, Foley & Smith, architects.

For the Army work in Bermuda the engineers are Ford, Bacon & Davis, New York, and Metcalf & Eddy, Boston, and the architects are Shaw, Naess & Murphy, Chicago.

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## Lumber substitutes tried on barracks

Largely as a means of putting pressure on the lumber industry to get prices down, the War Department is trying out several substitutes for lumber in cantonment construction. The most important of these is a sheet steel siding which is being used with considerable success at four cantonments housing about 70,000 men. In addition, asbestos cement shingles are being used at two or three hospital projects, and stained wood shingles are being used at another.

The steel siding, which is supplied by about a dozen different mills, comes to the job in sheets 2 ft. wide and up to 10 ft. long; irregular lengths, to fit the building, are pre-cut by the suppliers. The sheets are corrugated to resemble wood novelty siding; this is done for appearance and for bending strength.

The steel is applied to a standard wooden framing, except that studs are 2 ft. apart. They are applied, horizontally, beginning at the bottom, and nailed to the studs. Overlapping sheets are bolted together between studs. An insulating fibreboard is applied to the inner side of the studs, providing an interior finish.

Cost of the steel is about $55 per thousand sq.ft. as compared with a present price for novelty wood siding of about $45–48. However, since the steel price includes one coat of paint and since labor cost is lower, the installed price is thought to be about the same.

In a somewhat similar move to put pressure on the price of lumber, the Quartermaster Corps has authorized use of cardboard instead of wooden boxes for shipment of clothing and other equipment.

Photo by U. S. Army Air Corps.

## Defense housing at Fort Knox goes into high

*The Ft. Knox housing project comprises 700 dwelling units, four and eight-unit multiple type (ENR, Jan. 9, 1941, p. 60). This view shows the rapid progress which is being made on construction; 56 of the 700 dwelling units having already been completed and the balance of the units is expected to be ready for occupancy within the next 30 days.*

*This $1,935,000 project is part of the $45,762,500 housing program being undertaken by the FWA for the Army. Design of the houses, site plan, and supervision of the construction contract have been under the direction of PBA. The Fleisher Engineering & Construction Co., Lexington, Ky., are general contractors.*

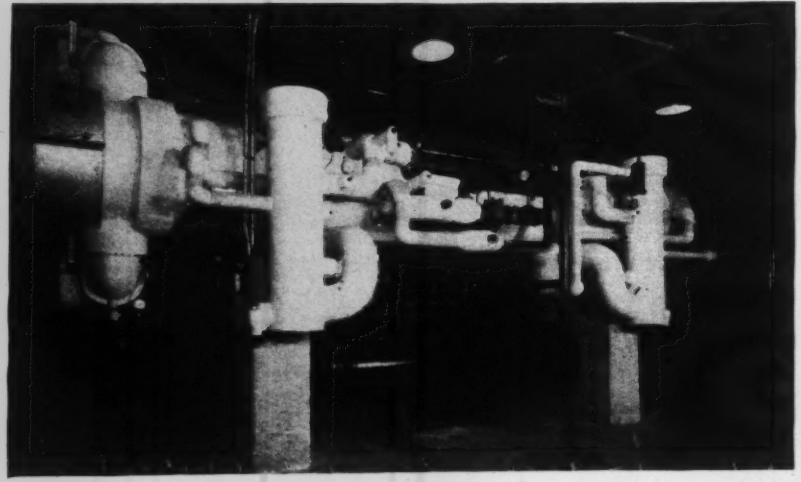
*United Benefit Life Insurance Co., office building, Omaha, Nebr.*

# Equipment installation for air conditioning

Complete air conditioning, including dehumidifying, was incorporated in the design of the home office building of the United Benefit Life Insurance Co. at Omaha. General offices in the building are supplied with conditioned air through perforated ceilings of acoustical material and the return air passes through inconspicuous side wall grilles. The compressor plant of 300 hp. capacity is mounted on a steel sub-base which is isolated from the structural elements of the building by rubber to minimize noise and eliminate the throb of the plant. From the basement to the roof extend the liquid and discharge lines and the 80-ft. vertical run of these lines is supported at a single point by a special beam located on the fourth floor permitting temperature movement in both directions. Charles H. Leopold of Philadelphia, Pa., was consulting engineer, and equipment was supplied by York Ice & Mchy. Co., York, Pa.

***SELECTOR SWITCH**, which starts the individual compressors, provides for rotating the starting sequence on the six compressors so that by changing the switch daily the units will be operated a uniform number of hours per year. The operation of all compressors and auxiliary equipment is indicated by pilot lights.*

***THE COMPRESSOR SYSTEM** is a 300 hp. installation with individual capacitor-type motors. This entire system is mounted on a structural steel base which is isolated from the building through the use of rubber supports. This mounting also includes all suction, discharge and oil lines as well as electrical connections and other compressor connections to isolate these from contact with the structural frame of the building. This arrangement, together with the use of a discharge surge drum, minimizes pulsation and reduces noise. The thermostat control, operated indirectly by the dew point in the humidifier, starts and stops the individual compressors as they are needed.*



***WATER COOLER** which provides cold water for circulation to the air humidifier is of modern design including heat exchangers for efficient operation. Below the cooler is located the storage tank of sufficient capacity to hold the entire charge of refrigerant. When the plant is not in operation or during shutdown for repairs, the refrigerant can be stored conveniently and without loss.*

# WASHINGTON HIGHLIGHTS

A TOTAL of 775 short defense courses in engineering subjects are now being offered at 119 engineering colleges with the aid of a $9,000,000 appropriation administered by the Office of Education. This would provide for a maximum enrollment of about 58,000 students. The largest number of these, 22,000 would be in the various branches of mechanical engineering; industrial engineering comes next with 14,000. Possible civil engineering enrollment totals 3,200.

THE FARM SECURITY Administration announced last week that it is rushing plans for the construction of 1,000 dwellings at Greenbelt, Md., to house some of the defense workers coming into Washington and vicinity.

Provision for the new houses, which will more than double the present population of Greenbelt, was included in an assignment of defense housing projects recently announced by John M. Carmody, Federal Works Administrator. Funds for the housing are provided by the Lanham Act and are administered by the FWA.

Designs for the new houses at Greenbelt will harmonize with the existing structures and the new development will represent a continuation of the present town plan.

LIEUT. COL. LACEY V. MURROW, former Washington State Highway Director recently called for active duty, is now on 90-day leave from the War Department in order to act as consultant to PRA on the program of flight strips along highways which was incorporated in the last highway authorization bill. As a preliminary to this work he is going abroad to study British emergency landing field practice.

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## Salary cuts for Illinois highway employees

Salary reductions totaling $30,840 annually for 120 employees of the Illinois division of highways has been announced by Walter A. Rosenfield, new director of public works and buildings. Mr. Rosenfield states, the cuts were made to bring certain salaries in line with those paid for similar work in private industry.

Typical reductions included some assistant engineers from $250 to $200 a month, others from $225 to $165. The new director had already dismissed 500 employees from the department in a move to reduce expenses.

## Vast expenditures in next 16 months

About four and a quarter billion dollars, by present indications, will be appropriated by the federal government within the next few months for public construction to be carried out between now and July, 1942. This huge total is close to the total volume of engineering construction, public and private, in 1940, which itself set an all-time record. The estimate, moreover, is based on projects now definitely planned; it takes no account of current somewhat vague plans for stepping up the rate of industrial expansion (said to involve nearly a billion dollars worth of new munitions plants), nor does it allow for the now unforeseen emergencies certain to arise in the next few months.

The total is made up of the following items, more or less in order of certainty: Regular budget for fiscal 1942, $1,164,000,000; additional military construction already announced, $1,116,000,000; construction of shipyards and naval ordnance plants (reduced to eliminate machinery), $300,000,000; defense housing, $150,000,000; defense roads, $287,000,000; local defense public works, $300,000,000; Atlantic bases (additional to the estimate announced last week), $200,000,000; additional $750,000,000.

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## Public works help for defense towns

An attack on the vexing problem of providing municipal utilities and other public works in communities faced with greatly expanded needs as a result of defense activity is made possible by a section unexpectedly inserted in the Lanham Bill—an administration measure providing additional funds for defense housing.

The bill would authorize appropriation of $300,000,000 for public works "required in connection with defense housing and other defense activities," the money to be spent by the Federal Works Administrator for outright federal construction or to be used for loans and grants to local public bodies. Loans and grants would be on whatever terms the Administrator thought proper. Negotiated fee contracts for the construction would be permitted. Prevailing wages would be required.

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## AVA opposed by the western states

Representatives of 13 western states, meeting at Denver, Colo., Feb. 7, by special invitation of Colorado's Governor Ralph L. Carr, voted unqualified opposition to any proposal for creation of "power yardsticks" as proposed under Arkansas Valley Authority, anywhere west of the Mississippi River.

A resolution was adopted which put the conference of western reclamation states on record in opposition to AVA for the West, and any authority of a similar nature for other river basins. The following specific recommendations were transmitted to western congressmen: (1) that they opposed the AVA measure and all similar measures by all appropriate means; (2) that appropriate steps be taken to coordinate activities of existing federal agencies in investigating and developing water resources; (3) that congress consider the desirability of amending the national reclamation act of 1902 in order that it may function outside the western area; (4) that all federal legislation relating to the control, regulation and utilization of water in interstate river basins should recognize the principle of equitable cooperation between federal and state governments, each operating within its constitutional limitations.

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## Mexico to spend $18,300,000 on roads

Mexico will invest $18,300,000 in highway construction this year, the highest amount the country has ever spent for such work in any one year, according to announcement by Ing. Jesus de la Garza Gutierrez, minister of communications and public works.

The federal government will provide half of this amount and the remainder will be forthcoming from state administrations. Construction of the southern Mexican section of the Pan American Highway, the road between Mexico City and the Guatemalan border, is to be accelerated. The government expects to complete the last lap of this road, the section between Oaxaca City and the Isthmus of Tehuantepec, before the end of the year. The Mexican government has spent $3,180,000 on the Pan American highway during the past five years.

Plans call for a modern highway to be constructed through north central Mexico, between Saltillo, capital of Coahuila state, and Piedras Negras, on the American border, at an approximate cost of $1,830,000.

Other work to be undertaken in Mexico during 1941 as announced by President Camacho, will provide irrigation works in the Mexicali Valley, Lower California Territory, over the border from California. Engineers of the national irrigation commission have been assigned to draft plans for this work and the undertaking is expected to be started before the end of the winter. The project is estimated to cost $815,000.

## Congress may investigate award of fee contracts

Quartermaster Corps procedure in the award of negotiated contracts appears likely to be investigated by Congress. Senator Truman, who is pushing for an over-all investigation of non-competitive defense contracts, charged last week that members of the civilian advisory board which makes preliminary selection of contractors are connected with firms holding contracts. At preliminary hearings held by the House military affairs committee to investigate the charge, Francis Blossom, a member of the board, testified that he is receiving part of the profit from an $11,000,000 shell-loading plant contract held by his firm, Sanderson & Porter. He pointed out, however, that the board had not had anything to do with the award of this contract.

Normal procedure in the award of fee contracts by Quartermaster Corps is for the advisory board to select from its files the names of three suitable contractors for each job. Contracting officers of the corps then negotiate with these firms and award the contract to one of them.

In urging an investigation, Senator Truman did not allege any corruption nor that any money had changed hands. He did claim, however, that contracts were being awarded to unsuitable contractors on the basis of personal friendship with civilian officials; in addition to the members of the advisory board, Harvey Blossom and F. J. C. Dresser, he mentioned in this connection Harry W. Loving, a North Carolina contractor now connected with the fixed-fee branch of the construction division, and W. H. Harrison, formerly construction coordinator for the Defense Commission and now head of the section on ships, construction and equipment of OPM. Truman, a forceful legislator, is thought likely to get his investigation. The administration may embrace the idea as a means of heading off a more hostile investigation.

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## Record attendance at A.G.C. opening meetings

Twenty-second annual convention of the Associated General Contractors of America opened Feb. 21 in Houston, Texas, with 760 advance registrations, the largest in the history of the association. Interest centered on defense construction with Brig. Gen. Brehon Somervell, Commander L. N. Moeller, Thomas H. MacDonald and Maj. Gen. Julian L. Schley scheduled to discuss construction phases of the defense program.

The meeting opened with an impressive memorial of the late Edward J. Harding, former managing director of A.G.C., read by George B. Walbridge. Edward P. Palmer announced the establishment of an Edward J. Harding Memorial Fund, proceeds of which will be used for such purposes as the trustees decide.

Managing Director H. E. Foreman stated in his report to the convention that the defense program will not amount to more than 25 percent of normal construction volume and appealed for consideration of the problems relative to the other 75 percent non-defense work. The labor situation on defense construction was scheduled to receive much attention at the meeting, with John P. Coyne, president of the Building Trades Dept., AFL, to be the principal speaker.

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## Canada to build airports on U. S. Route to Alaska

As a major extension of Canada's airport program, a chain of bases linking Edmonton, Alberta, with Alaska, is to be built immediately, according to an announcement by Air Minister C. G. Power in Ottawa Feb. 13. These airdromes, estimated to cost $9,000,000, will provide a flying route from the United States to Alaska east of the Rocky Mountains. Though the new air route is a direct recommendation of the United States-Canada Joint Defense Board, its cost will be borne wholly by Canada.

According to present plans seven bases, about 200 miles apart, will be constructed, extending from Edmonton to Whitehorse in the Yukon; the bases will connect at the two terminal points with existing American airports. In addition to its obvious strategic importance, the new route will be free from coastal fogs. The fields will be equipped with the most modern air-travel aids, and serviced for winter as well as summer flying. The surveys are partly completed and it is believed that in spite of heavy winter snows some construction materials are already en route to their destinations by tractor trains.

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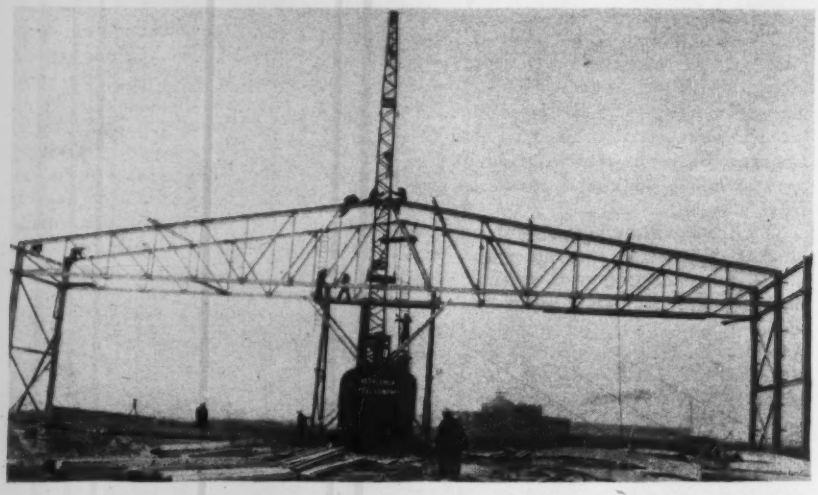
## New bridge commission for Pennsylvania

Pennsylvania's Governor Arthur H. James has revived the state bridge and tunnel commission, with appointment of three members: Elmer D. Harshbarger of Pittsburgh, William H. Neely, of Harrisburg, and W. R. Wolfinger, of Norristown. Specific duties of the commission will be the early acquisition of the Walnut and Market Street bridges across the Susquehanna river at Harrisburg, and the Clark's Ferry bridge north of the city. The commission is empowered to erect bridges and tunnels to operate on a toll basis and to take over toll bridges with aim of eventually freeing them from tolls.



### First all-welded hangar at Baltimore airport

*To house Maryland National Guard equipment, a 129x242-ft. hangar has been built at the municipal airport at Baltimore. The structure is believed to be the first all-welded building of its type to be constructed. The structural steel frame contains 221 tons of material and the welded design resulted in a saving of 60 tons as compared to a riveted structure. About 5,300 lin.ft. of shopwelding was required, equivalent to 1/4 in. fillet and 1,900 lin.ft. equivalent to 1/4 in. fillet was required in the field.*

*The building was constructed by the State of Maryland and was approved by the Constructing Quartermaster Corps. Construction was inspected by the U. S. Engineer Department and the T. E. Schafer Testing Laboratories of Baltimore. Van Rensselaer P. Saxe was consulting engineer. The welded structure was built by the Bethlehem Steel Co.*

# Canadian engineers consider effect of defense on engineering education

***Engineering Institute of Canada devotes a large part of its 55th annual meeting to discussion of educational questions raised by the expansion of war industries***

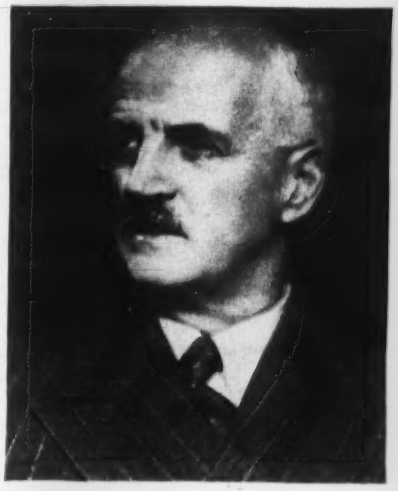
Meeting in Hamilton, Ont., industrial center of the Dominion of Canada, Feb. 6-7, the Engineering Institute of Canada, at its 55th annual meeting, focused attention on some of the engineering phases of Canada's war effort. Chief emphasis was placed on engineering education, not only with relation to war needs but also with reference to policies to be followed in the post-war years.

Registration exceeded 500; attendance at all meetings was correspondingly high. Notably absent was T. H. Hogg, president of the institute, who had been injured in an automobile accident a few days before the meeting. During the meeting, C. J. Mackenzie, dean of the college of engineering at the University of Saskatchewan, was inducted as new president of the institute. Newly elected vice presidents are K. M. Cameron, chief engineer of the federal Department of Public Works, and de Gaspe Beaubien, consulting engineer, Montreal.

Membership in the institute has increased, now exceeding 5,000, and the finances were reported to be in satisfactory condition. Steady progress in the formal cooperation of the institute with the various provincial engineering associations also was reported, the institute now having signed agreements with three provincial associations providing for automatic admission of members of the associations to membership in the institute. To facilitate this cooperation, the institute, early in 1940, abolished the grade of associate member. The recent entry of the institute into the Engineers Council for Professional Development was noted, and at one of the luncheon meetings George T. Seabury, secretary of the American Society of Civil Engineers, who also is secretary of E.C.P.D., spoke on the work of that organization.

### Engineering education

Many phases of engineering education were discussed by W. E. Wickenden, president of Case School of Applied Science, in his address at the annual banquet. Dr. Wickenden suggested that a five-year training course for engineering students may soon have to be considered. Engineering education also was made the subject of the opening technical session at which president Cullimore of Newark College of Engineering, representing Dean A. A. Potter of Purdue University, presented Dean Potter's paper on "Technical Training for National Defense." Dean Potter gave an outline of the main parts of the present program of special technical training for defense purposes that is now being followed in the United States, stressing the important part that technical skill occupies in defense measures. Dean Potter noted with satisfaction that officers of the U. S. Army and Navy as well as leaders in the engineering profession are insisting on the maintenance of high standards in engineering training in the engineering schools of the United States, also that these same officers are calling for an increase in research work. Prof. W. L. Malcolm, now of Cornell University and formerly of Queens University, described the special extension courses organized by Cornell at Buffalo for the aircraft industry.



**C. J. Mackenzie, New President, Engineering Institute of Canada**

*C. J. Mackenzie, dean of the college of engineering at the University of Saskatchewan, was elected president of the Engineering Institute of Canada at its annual meeting in Hamilton, Feb. 6-7. A native of St. Stephen, N. B., Dean Mackenzie graduated from Dalhousie University, Halifax, in 1909, and received his masters degree in civil engineering from Harvard in 1915. He started the first engineering courses at the University of Saskatchewan in 1912, reopened the College of Engineering in 1919, following the World War, and was appointed dean of engineering in 1921. He is at present acting as president of the National Research Council of Canada in the absence of Lieut. Gen. McNaughton, who is in England in command of the Canadian forces there.*

Dean Ernest Brown of McGill University stressed the desirability of maintaining standards in engineering education, but went on to explain the difficulties involved in doing this at the present time in Canada. He stated that there is increasing pressure from industry and from some governmental agencies for the release of engineering students in the senior year before completion of their courses. McGill had to release a few senior students for this reason, but otherwise is carrying on as usual. Dean Brown suggested that due to the enlistment of many young graduate engineers in the armed forces, it may be found that not enough students in engineering are at present being trained. He added that another major difficulty is the fact that no post-graduate students are now working in engineering at McGill and so are not available for help in laboratory work.

### Teaching term cut

Prof. C. R. Young told of what is being done at the University of Toronto where similar unrest among senior students is evident. Of 192 students in the senior year, about 30 already have left their work with the permission of the faculty to engage in war work or to enlist in the Canadian forces. In consequence of the pressure from industry, it has been decided to curtail the final year of study by cutting out all formal examinations and by shortening the length of the teaching term by two weeks, concluding the lectures on March 15 instead of April 1. Formal examinations for the first-year students also are being cut out in order to release them for special vacation work. Professor Young stressed the need for leadership in connection with the scientific aspects of Canada's war effort, stating that this is most necessary if the universities are to chart their courses aright. He referred specifically to the question of teaching staffs, suggesting that the work of engineering instruction is just as much a part of the war effort as actual participation in the armed forces and that neglect of this fact is tantamount to "eating our seed grain." He concluded by stating that it is not sound engineering educational practice to have too specialized training in the undergraduate curriculum.

Broader questions of engineering education were brought up in the report of H. F. Bennett, chairman of the institute's committee on the training and welfare of young engineers. This committee has been authorized to prepare a small booklet on the engineering profession in Canada as a supplement to a similar

booklet on engineering as a career prepared by the Engineers Council for Professional Development. Mr. Bennett stressed the necessity for keeping undergraduate engineering training as broad as possible and emphasized the importance of proper correlation of engineering and social studies. In discussion, one member of the committee quoted a report from an English university where engineering training is being carried on with no relaxation of standards, length of training or examination, despite the fact that all the windows of the engineering building have been blown out by bomb explosions.

#### New scenic highway

In technical sessions devoted to civil engineering subjects, a paper on the construction of Canada's new scenic highway from Banff to Jasper was presented. The paper was by T. S. Mills, chief engineer of the engineering and construction service, Department of Mines and Resources. Located entirely in the Banff and Jasper national parks, the new road was undertaken as a federal project, unlike normal road construction in Canada. Evidence of skill in its location is shown by the fact that while the highway is 149 miles long and runs through one of the most spectacular sections of the Canadian Rockies, it has only 23 miles of winding mountain road. Construction was largely a relief operation and extended from September, 1931, to November, 1939.

#### Power development

J. A. McCrory, chief engineer, Shawinigan Engineering Co., presented a description of the LaTuque water power development on the St. Maurice River, fifth of the major plants of the Shawinigan system on that river. A head of 114 ft. is being used to produce 178,000 hp. in four units, and water passages have been provided for two additional units. The paper describes the detailed tests of the turbine runners as a preliminary to the design work and the main features of the finished design. Comparison was made between the methods of construction, planning and operation carried out at the earlier Shawinigan plants and those developed for the LaTuque development. Had the LaTuque plant been built with the same labor and materials prices and methods of construction that were applied to the LaGabelle plant, built in 1924, its cost would have been increased by $1,500,000. The saving was the result of improved construction planning, methods and plant.

#### Structural design

The final technical session was devoted to a paper on "Moment Distribution and the Analysis of a Continuous Truss of Varying Depth," by E. R. Jacobsen, of Montreal. So much interest was shown in this paper that the suggestion was made that a structural session should become a regular feature of all annual meetings of the Institute.

The paper discussed the analysis of stresses in a five-span continuous highway truss of varying panel depth by means of an adaptation of the moment-distribution method. It also illustrated the use of a method whereby a close stress analysis of such a truss may be made without reference to the area of the members, and it outlined a way for making one set of moment-distributions cover all the numerous cases of partial loading that may be encountered in the preparation of such a design. Discussion of the paper covered a wide field, no serious criticism of the method being made, but there was critical comment of the general practice of using a truss design continuous over as many as five spans. Mention of the possible effect of yielding foundations brought limit design into the discussion, with references to the discussion of that matter at the last annual meeting of the institute.

### Novel automatic neon flash railway stop signal

*A novel and highly effective Neon sign, electrically controlled, has been installed at the Illinois Central Railway main line crossing on State Route No. 7, approximately 1.4 miles north of Grenada, Miss.*

*When a train comes within 2,300 ft. of the crossing the signal begins to work, lighting up the words "Stop-Death-Stop," at the same time lighting the directional arrow and focusing light on the skull and crossbone insignia. At this point a siren whistle gives warning that a train is approaching. The word "Death" operates on a flasher circuit, causing it to flash on and off every two seconds while the train is coming. After the train passes, the signal cuts off. Each warning word is on a separate hookup transformer, thereby making it possible for the remainder of the signal to operate if one of the transformers should fail.*

*In case the 110 volt a.c. circuit failed, two red double-faced stoplights, operated on a stand by batteries are on the overhead frame and a siren on the same circuit with the flasher lights also operates from the batteries. When the power line comes on again the relays automatically cut over to the a.c. 110 volt circuit again. Cost of operating the signal has been checked at a figure of less than $4.50 per month.*

*The track circuit which starts the signal was arranged by the engineering department of the Illinois Central Railroad. Construction of the signal was under the supervision of the Mississippi State Highway Department, J. A. Hadley, district engineer; S. S. Holder, district construction engineer, and W. H. Crowder, project engineer. The signal was designed by W. A. Billups of Grenada, Miss.*

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### Limited-access law sought in Massachusetts

Legislation providing for the construction of limited-access roads has been introduced into the legislature of Massachusetts by the State Planning Board. The state now has no way in which encroachments on new main highways can be prevented.

## Half billion asked to finish cantonments

***More than a billion of new military construction money proposed in new requests to Congress***

The President last week asked Congress to appropriate an additional $575,000,000 to finish the present cantonment program. This, together with appropriation requests and project authorizations for naval public works of about $430,000,000 and several smaller requests for military construction, placed in the legislative hopper a total of about $1,116,000,000 worth of strictly military construction.

The new cantonment money does not represent an increased program over that now under way. Of it, $339,000,000 is to cover increases in the cost of the work as compared with the estimates on which the original appropriation of about $466,000,000 was based. These estimates were necessarily very rough, since when they were prepared the projects had not been designed and some sites not selected. They were based on a computed per-man figure amounting to about $450 in cantonments and $320 in tent-camps. Actual unit costs have run to about $700 in cantonments and $500 in tent-camps.

Increased costs of labor and materials account for 25-35 percent of the increase and changes in the plans for 15-25 percent. The remaining of 50-60 percent represents errors in estimating or deliberate underestimating to keep the figures within limits that would meet with Congressional approval.

Another $236,000,000 is to cover the cost of recreational, training, reception and other facilities at the camps which were not contemplated at the time the original appropriations were drawn up.

The $430,000,000 for naval public works consists partly of Presidential requests for funds and partly of projects recommended by the House committee on naval affairs but for which no money has yet been asked. Included in this latter category is $78,445,000 for naval work at the new Atlantic bases. Other big projects include $35,000,000 for a fleet anchorage at Puerto Rico, $25,000,000 for the Marine Corps, and $13,000,000 for enlargement of the pilot training center at Corpus Christi.

Presidential requests also include $70,000,000 for more work on Army air bases and powder magazines. Some $30,000,000 is asked for river and harbor work of a defense nature. This includes a $17,674,000 protected harbor at Los Angeles and Long Beach, seaplane operating bases at Hawaii and San Diego, and a 30-ft. channel to the Corpus Christi air station. About $11,000,000 is asked for further protective works at Panama.

## Connecticut to spend $34,500,000 for roads

The Connecticut State Highway Department has budgeted $34,504,827 for roadwork for the two-year period beginning July 1, 1941. Though this amount is $5,000,000 less than estimated current expenditures, the Hartford-East Hartford and New London-Groton toll bridges are not included, nor is construction of Wilbur Cross Parkway.

Bond issues have already been voted to finance the bridges. The legislature has authorized a $4,000,000 bond issue for the parkway project, while an additional $10,000,000 bond issue has been recommended by Commissioner William J. Cox of the state highway department to continue its construction. Better highway facilities between New Haven and Hartford are badly needed, and this added bond issue would provide a modern, adequate highway between the two cities. As in the case of the toll bridge financing, it is suggested that the $10,000,000 bond issue could also be financed through tolls.

A breakdown of the 1941-43 budget shows $8,481,045 appropriated for payment to contractors; $1,127,500 for land payments; $1,400,000 for state aid construction; $6,000,000 in town aid grants, and $760,000 for repayment to towns in anticipation of state aid. Personal service payments will cost $7,875,205. Highway materials are estimated at $2,101,937, and motor vehicle supplies $1,020,807. Purchase of new trucks will cost $1,086,600.

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## Salary increase for Indiana road engineers

Engineers of the Indiana State Highway Commission will receive an approximate 15 percent increase in salary made possible by the signature of Governor Henry F. Schricker to a bill authorizing an additional allotment of $300,000 to the highway commission for the last six months of the fiscal year for personal service. The increase will be applied as of Jan. 1.

Passage of the measure met an emergency situation which was becoming acute. Nearly 100 engineers have left the highway commission in recent months in order to take advantage of better paying positions elsewhere. This situation had forced a jam in the state road building program. Some projects already laid out and considered necessary for national defense had been delayed.

James D. Adams, chairman of the Indiana State Highway Commission, pointed out that $15,378,035 in contracts are now outstanding.

Commissioner Adams has issued an appeal for engineers to apply for these jobs.

*Photo by Dishinger-Woodward*

## Jacksonville is getting a new bridge

***Tower erection for the 365-ft. vertical lift span of the new Main Street bridge over the St. Johns River at Jacksonville is nearing completion. Badly needed, since there is only one other bridge across the river, the new structure will be about 1,200 ft. long, consisting, in addition to the lift span, of two 250-ft. truss spans and a 350-ft. three-span continuous girder layout. On U.S. Route 1, the main East Coast highway, it is a Florida State Roads Department project, for which the steel is being fabricated and erected by the Mount Vernon Bridge Co. The bridge will have a roadway 42 ft. wide.***

# MEN AT WORK

*After a long experience in federal, state and municipal public works activity, DAVID W. GODAT has entered private consulting practice as a member of the firm of Barnard, Godat and Heft, in New Orleans. For the past 17 yr. he has been bridge and maintenance engineer for the city of New Orleans. In his new work he will specialize on grade separation projects.*

*L. J. CONADY, at left, holds a consultation with his boss, A. I. SAVIN, at the scene of the new highway bridge being erected over the Connecticut River at Hartford, Mr. Conady is project engineer for A. I. Savin Const. Co., which holds the bridge contract.*

*R. C. (JIM) PIKE has been with the Wyoming State Highway Department since 1924, and currently is resident engineer on bridge construction. When Jim is not in the field supervising construction he spends his time in the Cheyenne office designing new bridges to build. Never satisfied—he is always looking for new worlds to conquer.*

*KENNETH MARKWELL has been on the payroll of PWA for seven years, first as state engineer of Tennessee, chief project engineer with supervision of 22 power developments in four states of the TVA area, and since 1938 has been holding down the position of project engineer for the $40,795,000 Santee-Cooper power and navigation work in South Carolina. Ken hails from Oklahoma but says, "the deep South has its appeal."*

*SCOTLAND G. HIGHLAND, general manager and senior engineer of the Clarksburg (West Virginia) Water Board, who celebrated his 35th year of service with the board on Feb. 1. "In all this time," says he, "I've been associated with Christians and pagans, cannibals and horse thieves, but I've yet to lose a dollar or a pound of flesh."*

*When the Southern Bell Telephone Co. recently installed a new dial system at Wilmington, N. C., they invited J. E. L. WADE, the city's commissioner of public works to the inaugural ceremonies launching the new service. He is shown here waiting for the connection to go through for the first long distance call over the system.*

*Lighting up after a hard day, COMMANDER R. V. MILLER, (CEC), U. S. Navy, hopes to forget his job of directing construction on the 25-million-dollar airbase at Quonset, R. I., until another day. Highways, railroads, dredging, buildings, sewers, and water supply all come under his supervision.*

*With their heads together, these men are studying plans for PBA's 3,000-family unit defense housing project now under construction by FWA at San Diego, Calif. to house industrial workers in the aircraft industry. Left to right: MEL LIPPMAN of McNeil & Zoss Const. Co.; C. DAVID PERSINA, PBA architect; S. S. SANDERS, PBA site planner and LAWRENCE G. McNEIL, president of McNeil Const. Co.*

## Urgent defense road needs put at $287,000,000

(*Continued from p. 1*)

roads constitute the most urgent defense-road requirement. The PRA points out that the reservation road work is under the Army and Navy exclusively.

### Tactical roads

The PRA recommends that $25,000,000 be appropriated to be applied to the "improvement of roads to be used regularly in the tactical maneuvers of the army, and for the reimbursement of out-of-pocket costs of states and local governments for repairs necessitated by the occasional use of roads for the same purpose."

"It does not appear to be practicable, in any reasonable highway program, to strengthen all the lightly surfaced local roads in all areas that might be used for battle practice. Moreover, even if it were practicable, such strengthening of all road surfaces would not be desirable from the standpoint of troop training. Actual battle fields cannot always be chosen in advance, and roads that are not of the best must sometime be encountered by armies in combat. Military commanders expect to find some roads inadequate and even virtually impassable, and they have trained engineer troops for the purpose of coping with just such situations."

### Strategic network

To provide for the replacement of substandard bridges and the correction of other critical deficiencies of the strategic network at a desirable rate, the PRA recommends a supplementary appropriation of not less than $100,000,000. "This appropriation should be prorated to the states on the existing federal-aid basis and used solely for designated defense projects. It should be available to pay all legitimate costs of the project on a somewhat higher basis of federal participation than the existing 50-50 basis, but otherwise should be expended under the provisions of the federal highway acts."

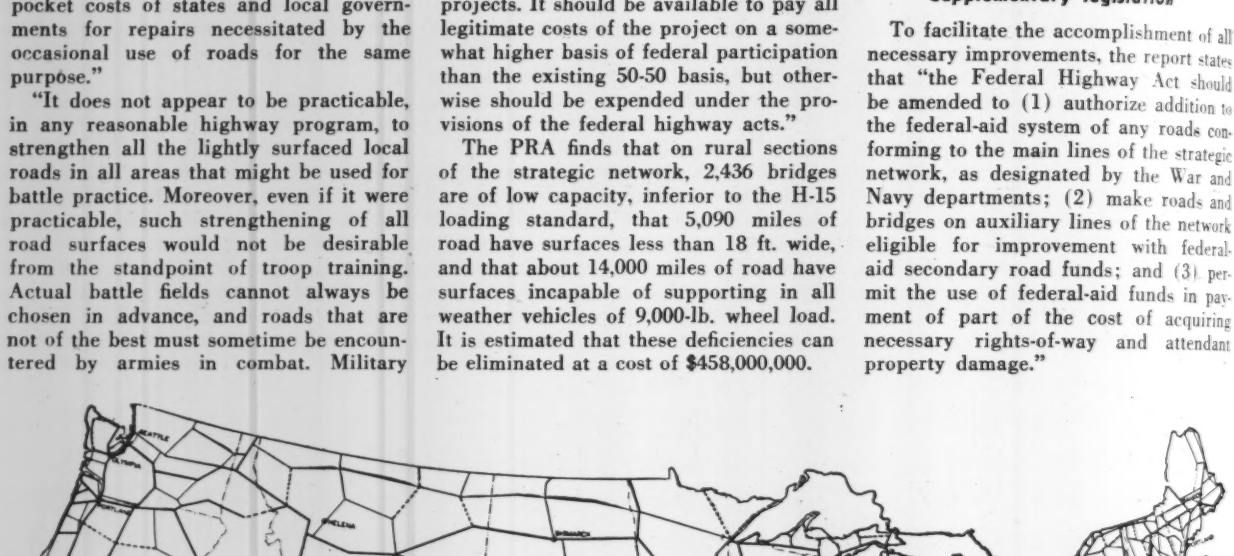
The PRA finds that on rural sections of the strategic network, 2,436 bridges are of low capacity, inferior to the H-15 loading standard, that 5,090 miles of road have surfaces less than 18 ft. wide, and that about 14,000 miles of road have surfaces incapable of supporting in all weather vehicles of 9,000-lb. wheel load. It is estimated that these deficiencies can be eliminated at a cost of $458,000,000.

These deficiencies, states the report, should be provided for as urgent necessities. "Otherwise the improvement of the strategic network is not stamped with the defense urgency that distinguishes reservation and access roads and some tactical roads."

For making engineering surveys and plans for development of the strategic network, including extensions of the system into and through municipalities and metropolitan areas the PRA recommends appropriation of $12,000,000, to be prorated to the states and matched by them on the existing federal-aid basis.

### Supplementary legislation

To facilitate the accomplishment of all necessary improvements, the report states that "the Federal Highway Act should be amended to (1) authorize addition to the federal-aid system of any roads conforming to the main lines of the strategic network, as designated by the War and Navy departments; (2) make roads and bridges on auxiliary lines of the network eligible for improvement with federal-aid secondary road funds; and (3) permit the use of federal-aid funds in payment of part of the cost of acquiring necessary rights-of-way and attendant property damage."




## Latest version of the strategic highway network

*Priorities are indicated for the first time on this diagrammatic map issued with the Public Roads Administration report on defense highways. The routes indicated are not necessarily those of existing roads; they only show between what points the military authorities want an adequate military highway. In some regions parallel routes with cross-connections will be required. The total mileage of main roads in the defense highway network is placed at 74,600, of which 42,400 are first priority, 23,100 second, and 9,100 third priority.*

## Government speeds work on its power projects

TVA's budget for fiscal 1942 has been stepped up $10,000,000 to $79,800,000. The increased money is to permit more rapid construction of the Fort Loudon dam and reservoir, on which it was originally intended to spend $5,925,000 during the coming fiscal year. This will bring Fort Loudon's 35,000 kw. into operation in the fall of 1943 instead of the spring of 1944.

With the same purpose of accelerating provision of electric power, the President has asked immediate appropriation of $7,500,000 for Grand Coulee and $1,000,000 for Boulder to permit doing work this spring originally scheduled for fall. It is thought likely the 1942 budget estimate for Grand Coulee will be stepped up to permit ordering three more of the 108,000-kw generators, bringing the total on order to nine. Similarly, an attempt will probably be made to boost the budget for Shasta Dam by $37,000,000.

Meanwhile several new power projects are under consideration. Biggest of these is the $22,500,000 Bullshead Dam on the Colorado River between Boulder and Parker; Reclamation is now completing studies of this project. Other likely possibilities are a 150,000-kw steam power plant connected with the Central Valley project and another 60,000-kw generator at TVA's Watts Bar steam power plant.

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## Defense gets preference on structural shapes

Formal priorities on structural steel shapes moved a step closer last week at a meeting between the priorities division of the Office of Production Management and major steel producers. As pointed out in *ENR* last week (p. 77) it is still hoped that imposition of mandatory priorities can be avoided, but in the last few weeks both defense and non-defense users of shapes have been experiencing difficulty with deliveries.

At the meeting it was agreed that the rolling mills would intensify their efforts to give preference to defense orders. Present expectation is that the pressure on the mills will begin to ease off early in the summer, but an expanded program of industrial expansion such as is being widely talked of in Washington might upset this expectation.

How long the situation can remain on this informal basis depends upon the extent to which the mills prove willing and able to ration their product in just the way OPM would like it done—without the guidance provided by an actual system of priorities. This is hard; it means not simply deferring non-defense deliveries but deciding on the relative defense urgency of steel for, say, a strategic highway bridge, a machine gun plant, and a shipyard. Some guidance is provided, in the case of industrial plants, by the existing priority rating on the product to be manufactured in it. But defense construction contracts have not so far been given priority ratings, while the only defense status attaching to highway projects is that the Public Roads Administration thinks almost any road construction nowadays, is a defense project.

However, whether or not formal priorities arrive, it seems clear that non-defense structural steel users have little chance of substantial deliveries before summer. Whether warehousemen will be permitted to maintain their stocks has not yet been decided. OPM is thinking about it.

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## Construction men plan self-regulation in Canada

A joint board to regulate and adjust wages, hours and working conditions for the whole of Canada is to be set up by the Canadian Construction Association and the Trades and Labor Congress of Canada. Decision to set up such a board was reached at a conference held in Ottawa during the week of Feb. 10. The joint board, representing employers and labor equally, is to function for the duration of the war or perhaps longer. Its formation is hailed as a highly constructive effort to promote industrial peace in the Dominion. The board's first duty will be to divide Canada into zones and set up zone committees to which all questions of working conditions will be submitted. In areas where wages have not been fixed by the federal Labor Department, the department is to be asked to consult the committee before setting rates and working conditions. Changes in established scales of wages during the war are to be made only on the basis of increase in the cost of living.

It was agreed that no stoppage of work during the war period would be permitted because of jurisdictional disputes. These must be settled by existing machinery. Collective agreements between employers and employees are recommended.

Other important actions of the conference included a unanimous vote to have the construction industry placed under the provisions of the National Unemployment Insurance Act; a resolution urging an extensive program of national building and improvement works after the war, to provide for continuing employment in the building trade; a request for continued governmental assistance for technical education, and a suggestion that the Ontario Apprenticeship Act be adopted in other provinces of Canada.

## Four well-known army engineers get promotions

Among the numerous army officers to get promotions last week were four well-known engineers. Col. Philip B. Fleming, federal wage hour administrator, was named brigadier general. He will continue in the wage-hour position.

Lt.-Col. Brehon B. Somervell, recently placed in charge of the Construction Division, Quartermaster Corps, U. S. Army, has also been promoted brigadier general.

Those promoted to major generals included Brig.-Gen. Clarence S. Riley, onetime Panama Canal commander and now to command the 6th Division, Fort Snelling, Minn.

Col. John W. N. Schulz, to be director of purchases and contracts in the office of the Under Secretary of War, was made brigadier general.

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## Plans mapped for Ohio River flood wall

Construction of a flood wall along the Ohio River near Portsmouth, Ohio, is expected to be under way before spring. The structure will be a reinforced concrete wall, approximately 4,000 ft. long.

Bids will be opened by U. S. engineers of the Cincinnati district, Mar. 10. Included in the materials required are more than 3,000,000 lbs. of reinforcing steel, steel sheet piling and miscellaneous metal, also 19,950 cu.yd. of concrete, six sluice gates, and eight movable gate closures. The work is to be completed within 275 days from date of contract.

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## PBA approves Ohio road fund for 1942

Hal G. Sours, Highway Director of the Ohio Department of Highways, announces that PBA has given its approval of the state's primary federal aid program for 1942 which will involve an expenditure of $7,252,336.

The total amount of the program runs below the $8,455,540 program of 1941. Director Sours points out that after deductions of $225,336 for the planning survey, and a program reserve, there will be a balance of $7,927,000 for grading, drainage and bridge construction, with the exception of grade crossing elimination projects.

Approximately 60 percent of the expenditures will be on military highways and strategic roads of the state. A federal aid program for secondary highways, amounting to approximately $1,250,000, is still awaiting the approval of the PBA.

# MEN AND JOBS

HORACE G. LENG, civil engineer of Philadelphia with the Pennsylvania Public Utility Commission, has left that organization to join the Bureau of Yards and Docks, U. S. Navy.

RENÉ DUPUY, civil engineer, is now inspector in charge for the British Air Ministry at the Canadian Vickers, Ltd., Montreal. Following graduation from the Ecole Polytechnique of Montreal in 1935, Mr. Dupuy worked with the Quebec department of highways until 1936, when he joined the Ontario Paper Co. In 1939 he joined the British Air Ministry, returning to Canada early this year after a period of intensive training under war conditions in England.

ROLAND A. LEMIEUX, civil engineer, has been appointed assistant district engineer for District No. 1 with the roads department of the province of Quebec. Following his graduation from the Ecole Polytechnique of Montreal in 1937, Mr. Lemieux joined the department of roads.

STANLEY P. ZOLA, a graduate of the University of Wisconsin and division engineer in Milwaukee for the Great Lakes Dredge & Dock Co., has joined the Civil Engineering Corps, U. S. Navy, as a lieutenant. He has been assigned to active duty with the Bureau of Yards and Docks.

LIEUT. DANA T. MERRICK, civilian engineer employed by the U. S. Engineers in the Little Rock, Ark., district office, has been assigned to the Quartermaster Corps. He will be stationed at Camp Robinson with the rank of lieutenant.

FRANK P. BROWN, area engineer of the WPA at Sangamon County, Ill., has given up his position with that organization. He has not announced his future plans.

F. M. BREWER, supervisor of District No. 2 in Mississippi for the NYA, has been made a member of the state administrative staff at Jackson, Miss. Mr. Brewer, who graduated from the Mississippi State College in 1937, has been with the NYA two years. He is being succeeded by MALCOMB G. PRESTRIDGE of Bogue Chitto, Miss. Mr. Prestridge, who has been with the NYA for four years, also graduated from Mississippi State College in 1937.

HAROLD W. WEBSTER, civil engineering graduate of Mississippi State College in the class of 1937, has returned to Meridian, Miss., as area engineer with the NYA. He held a similar post from 1937 to 1939 and was with the U. S. Housing Authority in Birmingham, Ala., as engineer for a year.

EDWIN H. BLASCHKE, former assistant resident engineer for the Lower Colorado River Authority of Texas on the rehabilitation of Austin Dam, is now employed as job office engineer for the Foundation Co., New York, on the construction of two drydocks and a wet basin in the Fore River yard of the Bethlehem Steel Co. Mr. Blaschke is a graduate of Texas University with the class of 1935. He worked as valuation engineer for the Texas Railroad Commission for one year, then two years on cost engineering work for the Lower Colorado River Authority on construction of Buchanan Dam.

EMIL O. SCHOTT, who left the employ of the Pennsylvania Turnpike Commission in February last year to do structural work for the Pangborn Corp., Hagerstown, Md., late in 1940 accepted a position as junior structural designer with the Riley Stoker Corp., Worcester, Mass.

ROBERT M. HOLCOMB, JR., graduate of the University of Arizona and an instructor in civil engineering in that school, has resigned to join the teaching staff at Iowa State College.

R. A. BENDINELLI, engineer of the Mississippi State Highway Department, has left that organization to join the 106th Engineers at Camp Blanding, Fla.

EDWIN A. CLARKE, JR., engineer with the Soil Conservation Service and stationed at New Albany, Miss., has been ordered to report for active duty at Fort Bragg, N. C., as lieutenant.

W. A. RUSSELL, civil engineer formerly connected with the Mississippi State Highway Department, is now serving as lieutenant with the Construction Quartermaster, Naval Reserves, stationed at Pearl Harbor, Hawaii.

W. F. COX, JR., late last year began new work with Solomon & Keis, architect engineers, Camp Blanding, Fla., as assistant to ROY K. VANCAMP, engineer in charge of roads, grading and drainage at that camp. Prior to his new employment, he was civil engineering draftsman with the Georgia State Highway Department for 3½ years. He had also worked as draftsman and inspector for the city of Greensboro, N. C., and for the North Carolina State Highway and Public Works Commission.

GERALD E. SKINNER, of Corry, Pa., has been appointed project engineer for the Pennsylvania State Highway Department.

DONALD C. BLACK, Chelan county engineer at Wenatchee, Wash., has resigned his position, effective Mar. 1, to accept an offer in private industry.

JAMES M. BERKEY, planning engineer of Spokane, Wash., has been appointed by the Washington state planning council to assist counties and municipalities in making plans to take care of the increased population which is expected to materialize with the construction of the reclamation features of Grand Coulee Dam. Mr. Berkey will have headquarters at Ephrata.

F. G. HOSKINS, civil engineer, was appointed general manager of the B&O Railway's eastern lines, Jan. 1. He is a graduate of Drexel Institute and the University of Pennsylvania. He started with the B&O as a draftsman in the bridge department Aug. 1, 1907. For two years he was assigned to the American Railway Association and the U. S. Railroad Administration in the handling of troops and supplies during the World War. He was appointed superintendent of Baltimore Terminals in 1919, and made superintendent of the Baltimore division in April, 1921. Before receiving his recent promotion Mr. Hoskins was general superintendent of the Maryland district.

A. R. CARVER was appointed superintendent of the Monongah division of the B&O Railway Jan. 1. Mr. Carver entered the service of the B&O on Sept. 1, 1915, as district bridge inspector. He has held the post of division engineer at Cleveland, Ohio; Newark, N. J.; Connellsville, Pa.; and Cumberland, Md. On May 1, 1937, Mr. Carver was appointed acting superintendent at Wheeling and was made superintendent on Nov. 16, 1937, retaining this position until his recent promotion.

JACK WEICHERT, engineer on the Fort Peck Dam project, has sailed for Alaska as an army engineer. Mr. Weichert's home was at Laurel, Mont.

F. R. WHITE, chief engineer of the Iowa Department of Highways, has been appointed to the highway transport committee of the American Association of State Highway Officials to study the adequacy of the nation's highways for defense purposes.

DINTON B. LALLY, WPA area engineer for Monroe, Lucas, Madison and Clark counties in Nebraska, is now stationed at Fort Belvoir, Va. Mr. Lally is a first lieutenant in the army engineering corps.

## Golden Gate Bridge net again in use

*Parts of the safety net made of manila rope that was first used so successfully under the Golden Gate Bridge at San Francisco and is now rented to jobs where special safeguards are desired for steel workers, are once again in service, this time on the high trestle for concrete placing equipment at Friant Dam. As has been the case on several other jobs where the nets have been used, steel workers at first protested that they are unnecessary. However, after one of the steel workers fell and was saved by the net from a likely fatal accident, protests stopped.*

## U.S.B.R. transfers top-flight engineers

The U. S. Bureau of Reclamation's expanding electric power program is expected to be speeded up through the transfer of three top-flight engineers to new positions.

Harold L. Ickes, Secretary of the Interior, has announced that Irving C. Harris, director of power at Boulder Dam since 1938, will go to the Kennett division of the Central Valley project in California as senior engineer in charge of the installation of heavy power machinery at Shasta Dam; E. A. Moritz, construction engineer of Marshall Ford Dam in Texas since 1937, will become director of power at Boulder Dam, and will have administrative responsibility also for the future operation of Colorado River work below Boulder, eventually including Parker Dam and power plant. Samuel A. McWilliams, resident engineer at the Minidoka power plant in Idaho for a year, has gone to Parker Dam as construction engineer in charge of power-plant work, to succeed Edward C. Koppen, who died recently.

# JOBS OF THE WEEK

***HOUSING, Canal Zone.***
R. E. McKee, of Los Angeles, Calif., was lowest bidder for constructing housing facilities at various posts in Canal Zone at cost of $2,302,150. MacDonald Construction Co., St. Louis, Mo., bid $2,303,165; Southern Construction Co., Panama City, C. Z., partial bid, $334,675 and $602,067. Bids received by Constructing Quartermasters.

***CANTONMENT, Pendleton, Ore.***
W. C. Smith, Inc., of Duluth, Minn. and Denver, Colo., has been awarded contract for constructing 123 temporary type buildings for Pendleton Air Corps cantonment and utilities system, at a cost of $1,168,349; excavation, paving and embankment from Jacobsen-Jensen Co., Portland, Ore., $177,575. Bids were opened February 7 by U. S. Engineers, Portland, Ore.

***SEWAGE TREATMENT WORKS, Brooklyn, N. Y.***
E. W. Foley, Inc., Brooklyn, N. Y., has been awarded contract by Department of Public Works, New York, for structures, and equipment for extensions and additions to Coney Island Sewage Treatment Works, cost estimated at $893,097.

***BOMBER ASSEMBLY PLANT, Omaha, Neb.***
Peter Kiewit Sons Co., and George W. Condon, Omaha, Neb., and Woods Brothers Construction Co., Lincoln, Neb., have been awarded contract for constructing a bomber assembly plant, by War Department, Washington, at a cost of $8,078,000.

***DRYDOCK, San Diego, Calif.***
Pacific Bridge Co., of San Francisco, Calif., has been awarded contract for constructing a drydock at Destroyer Base by Yards & Docks, Navy Department, Washington. Estimated cost is $2,800,000.

***SHIP WAYS, Mobile, Ala.***
U. S. Maritime Commission, has awarded a contract for construction of four ship ways and other ship building facilities to Alabama Dry Dock & Shipbuilding Co., of Mobile, at an estimated cost of $1,322,500.

***SHIP WAYS, Wilmington, N. C.***
U. S. Maritime Commission, Washington, has awarded contract for construction of six shipways and other building facilities to North Carolina Shipbuilding Co. (subsidiary Newport News Shipbuilding & Drydock Co., Newport News, Va.) Wilmington, to cost $5,140,000.

***ORDNANCE DEPOT, Fort Wingate, N. M.***
Sharp & Fellows Construction Co., Los Angeles, Calif., has been awarded contract to construct 650 igloo ammunition storage houses, 12 administration buildings, shops, and living quarters. Twenty-eight mi. of railroad work was awarded to W. A. Smith, Houston, Tex.; and 98 mi. of highway construction and fencing to L. A. Allison, Albuquerque, N. M. Contracts awarded by Construction Quartermaster, War Department. Estimated cost $9,000,000.

***INSPECTION SHED AND SERVICE BUILDING, Brooklyn, N. Y.***
T. J. Waters & Sons, New York, N. Y., was lowest bidder for constructing an inspection shed and service building at Pitkin Avenue Yard, Brooklyn, for Board of Transportation, New York, N. Y., at $1,055,687 (official). Bids were opened February 11.

***SHIP WAYS, Baltimore, Md.***
Bethlehem-Fairfield Shipyard, Inc., Baltimore, Md., has received contract from Maritime Commission, Washington, for constructing thirteen ways and other ship building facilities, at Baltimore. Cost is $7,838,000.

***AIRPORT, Fort Wayne, Ind.***
Cooke Contracting Co., Detroit, Mich., was lowest bidder for constructing airport at Fort Wayne, Ind., to cost $1,393,312, by U. S. Engineers, Detroit.

***HOUSING, Bangor, Me.***
T. W. Cunningham, Inc., Winchester, Mass., will erect housing facilities at airbase, Bangor, Me., for U. S. Engineers, Boston, Mass., at a cost of $1,011,709.

***ARMORY, Washington, D. C.***
Charles H. Tompkins Co., Washington, D. C., has been awarded contract to construct second unit of District of Columbia National Guard Armory, by District Commissioners, Washington, at cost of $1,378,680. First unit was awarded to same contractor at $1,182,000.

***HOSPITAL, Hartford, Conn.***
Stone & Webster Engineering Corp., Boston, Mass., has been awarded contract to design and construct a 20-story hospital for Hartford Hospital. Cost estimated at $5,500,000.

NOTE—Additional bidding and contract news on over 800 projects large and small appear in the Construction News section beginning on page 18.

## OBITUARY

JOSEPH WHITE WILLIAMS, chief engineer of the Western Pacific Railroad Co. for 19 years, died Feb. 4 at San Francisco. Mr. Williams' career covered a period of about 40 years, in which he filled nearly all positions involved in railway engineering. From 1900 until 1907 he was with the Atchison, Topeka & Santa Fe in New Mexico and California on location and construction work. From 1907 to 1914 he was assistant chief engineer of the Northwestern Pacific Railroad Co., and from 1914 to 1917 he was chief engineer of construction. During the World War he was a major and lieutenant-colonel in the 18th Engineers, U. S. Army, in France. He became chief engineer of the Western Pacific in 1921.

CAPT. HERBERT F. HOWE, U.S.A. retired, consulting engineer for the Barber Asphalt Co. of New Jersey, for about 20 years, died at Port Au Spain, Trinidad, on Feb. 16. He was educated at Massachusetts State College and the Lawrence Scientific School of Harvard University. In his early career he was chief engineer of the Quito & Guayaquil R. R. in Ecuador, and also was engaged in engineering work in China, Mexico, Cuba and the Philippines. He was a captain of engineers in the World War.

J. HARVEY GILLINGHAM, one-time chief engineer of the Bureau of Surveys and later consulting engineer of the Department of Public Works, of Philadelphia, Pa., died Feb. 4. Mr. Gillingham was 73.

S. R. HARTWELL, engineer, 65, died Feb. 4 at Milwaukee, Wis. He had been with the U. S. Engineers' Office in Milwaukee and connected with federal engineering service for about 40 years.

ALBERT H. ONSTAD, chief construction engineer for the Weyerhaeuser Timber Co., died Feb. 5 at Tacoma, Wash. Mr. Onstad last year was awarded the modern pioneer scroll of achievement by the National Association of Manufacturers for his inventions in the field of application of power to the lumber industry. He was 62 years old.

CHARLES GORDON MCDOWELL, assistant general superintendent at the Radford powder plant, Radford, Va., died Jan. 31. He was 46, and had spent 13 years with the Georgia and the Alabama power companies.

LAUGHLAN ALEXANDER HAMILTON, veteran Canadian land surveyor, died in Toronto, Feb. 11. He was 89. Mr. Hamilton assisted in the laying out of the 49th parallel of the Canadian-U. S. boundary and also the townsite of what is now Vancouver. He had served as general land commissioner of the Canadian Pacific Railway.

MAJ. WILLIAM PARKIN, chief of the General Engineering Division of the U. S. Engineers Office, Memphis, Tenn., until his retirement five years ago, died at Memphis, Feb. 13. Major Parkin was 76.

JAMES R. HORTON, 57, president of the James R. Horton Construction Co., Buffalo, N. Y., died Feb. 11. He held the commission of colonel in the old 74th infantry.

MORGAN G. FARRELL, 55, died Feb. 2 in New York City. Mr. Farrell served as a captain of engineers in the A.E.F. during the World War.

WILLIAM GAGE, mining engineer, 75, died Feb. 5, at Twin Bridges, Montana.

JAMES EBERST, retired civil engineer, 63, died Feb. 4 at Toledo, Ohio. He was employed by the New York Central Railroad.

WILLIAM H. WALSH, 82, of Fayetteville, N. Y., died Feb. 5. He was a retired contracting engineer.

ROBERT T. CART, 64, civil engineer, died Feb. 4 at Connellsville, Ohio. He was employed by the Baltimore and Ohio.

## CONTRACTS AND CAPITAL

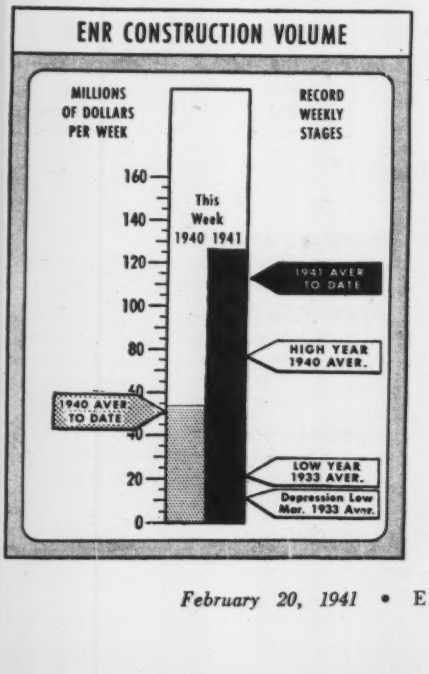
ENGINEERING CONSTRUCTION awards for the week, $126,113,000, are 138 percent higher than in the corresponding 1940 week. This is the 25th successive week in which current awards have topped their respective values of a year ago. Private awards gain 87 percent over last year, and public construction, as a result of the 1,052 percent increase in federal work, tops the 1940 week by 164 percent.

In addition to the $126,113,000 reported above for continental United States, $34,618,000 in awards for Atlantic Airbase construction were made during the week. The work on these bases in Bermuda, Newfoundland, Santa Lucia, British Guiana, Trinidad and Antigua is to be done by United States contractors.

The construction volume for 1941 to date, $900,749,000, is 123 percent over the total for the opening 8-week period last year. Private awards are up 90 percent over a year ago; and public construction is 141 percent higher, due to the 810 percent increase in federal work.

New capital for construction purposes for the week totals $37,018,000. This is 140 percent above the volume for the corresponding 1940 week. The current financing is made up of $14,611,000 in state and municipal bonds, $12,000,000 in RFC loans to private industry, $8,929,000 in corporate security issues, and $1,478,000 in USHA loans for low-rent housing projects.

New construction financing for the year to date, $653,833,000, is 296 percent greater than the $164,705,000 reported for the 8-week period last year.




### CONTRACTS

(Thousands of dollars)

| | Week Ending Feb. 22 1940 | Feb. 13 1941 | Feb. 20 1941 |
|---|---|---|---|
| Federal ..... | $6,019 | $61,237 | $69,368 |
| State & Municipal | 29,096 | 14,701 | 23,378 |
| Total public... | $35,115 | $75,938 | $92,747 |
| Total private... | 17,865 | 20,408 | 33,366 |
| TOTALS ..... | $52,980 | $96,346 | $126,113 |
| Cumulative 1941 .....(8 weeks)..... | | | $900,749 |
| 1940 .....(8 weeks)..... | | | $403,811 |

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

### NEW PRODUCTIVE CAPITAL

| | 1940 8 weeks | Cumulative 1941 8 weeks |
|---|---|---|
| NON-FEDERAL ..... | $164,705 | $144,833 |
| Corp. Securities..... | 28,214 | 46,294 |
| State & Mun..... | 75,144 | 71,388 |
| U.S.H.A. loans..... | 60,786 | 13,521 |
| R.F.C. loans..... | 561 | 13,629 |
| FEDERAL ..... | ..... | $509,000 |
| TOTAL CAPITAL ..... | $164,705 | $653,833 |

### FHA MORTGAGES

| | Week Ending Feb. 17 1940 | Feb. 8 1941 | Feb. 15 1941 |
|---|---|---|---|
| Selected for appraisal ... | $19,487 | $22,535 | $22,919* |
| Cumulative 1941 .....(7 weeks)..... | | | $140,491* |
| 1940 .....(7 weeks)..... | | | $116,034 |

* Subject to revision.

### ENR INDEX NUMBERS

| Index Base=100 | | 1913 | 1926 |
|---|---|---|---|
| Construction Cost | Feb. '41 | 250.50 | 120.42 |
| Building Cost | Feb. '41 | 208.42 | 112.67 |
| Volume ..... | Jan. '41 | 402 | 176 |

# CONTRACT UNIT PRICES

***What contractors are bidding on different kinds of construction work***

## BASCULE BRIDGE, BROOKLYN, N. Y.

OWNER: City of New York, Department of Parks. Robert Moses, commissioner.

PROJECT: Construction of Hamilton Avenue Bridge across Gowanus Canal. (Contract No. B-210-140). Bridge, of bascule type, consists of two single-leaf skew spans over canal, two bascule piers, and approaches extending from Ninth St. on north side to Sixteenth St. on south. Roadway elevation to be 5-ft. higher than existing structure. Approaches to occupy entire street area over which grades are to be raised. New cross-section of Hamilton Ave. provides center mall 36-ft. wide, two 50-ft. roadways, two 12-ft. sidewalk areas. At canal crossing, mall remains same width, roadways narrow to 42-ft., and sidewalks to 8-ft. Bridge provides 47-ft. clear channel. Bridge roadway is open grating; approaches sheet asphalt.

CONDITIONS: Contractor to furnish all material except pipe, valves, hydrants, etc., in connection with laying of watermains. Pipe removed from existing lines not to be used, but returned to owner. Project completion scheduled for 260 days after notice to proceed. Hamilton Ave. to be closed to through traffic. Wage rates specified are: skilled labor, $1.25 to $2.25 per hr.; semi-skilled, $1.00 to $1.50; and common, 87½c.

BIDS: Ten bids were received December 10, 1940, ranging from the contract low of $1,910,501 to $2,204,741. Engineer's estimate, $1,804,070.

LIST OF BIDDERS:

1. P. T. Cox Constr. Co., Inc., New York, N. Y. (contract) ..... $1,910,501
2. P. T. Carlin Constr. Co., New York, N. Y. ..... 1,924,215
3. Thomas Crimmins Constr. Co., New York, N. Y. ..... 1,932,701
4. A. M. Hazell, Inc., and F. L. Cranford, Inc., New York, N. Y. ..... 1,957,646
5. Rusciano & Son Corp., Bronx, New York, N. Y. ..... 1,990,150
6. National Excavation Corp., New York, N. Y. ..... 2,031,620
7. Poirier & McLane Corp., New York, N. Y. ..... 2,045,915
8. Arthur A. Johnson Corp. & Necaro Co., Inc., Long Island City, N. Y. ..... 2,150,596
9. Garofano Constr. Co., Inc., Mount Vernon, N. Y. 2,166,326
10. Tully & DiNapoli, Inc., Long Island City, N. Y. ..... 2,204,741

| Item | Quan. | Unit Prices (1) | (2) | (3) |
|---|---|---|---|---|
| 1. Remove exist. basc. spans, piers. | L.S. | $130,000.00 | $190,000.00 | $82,000.00 |
| 2. Unclassified excavation | 65,000 c. y. | .80 | .70 | 1.00 |
| 3. Uncl. excav.: ret. wall bases east side Hamilton Ave. | 6,200 c. y. | 5.00 | 4.00 | 9.00 |
| 4. As above, west side Hamilton Ave. | 6,500 c. y. | 6.00 | 4.00 | 8.00 |
| 5. 18-in. clos. end steel pipe piles. | 74,000 l. f. | 6.00 | 5.00 | 5.90 |
| 6. Loading tests, above piles | 5 ea. | 500.00 | 500.00 | 1,000.00 |
| 7. Untr. timber foundation piles | 37,000 l. f. | 1.00 | .70 | .75 |
| 8. Pile shoes for timber piles | 200 ea. | 2.00 | 1.25 | 1.50 |
| 9. Creo. timber piles, fenders | 9,000 l. f. | 1.50 | 1.40 | 1.80 |
| 10. Creosoted timber in fenders | 30 Mbm. | 175.00 | 225.00 | 310.00 |
| 11. Untr. timber in fenders | 35 Mbm. | 140.00 | 180.00 | 140.00 |
| 12. Metal in fenders | 20,000 lb. | .10 | .14 | .20 |
| 13. Setting 18-in. conduits | 270 l. f. | 5.00 | 1.00 | 3.50 |
| 14. Setting 6-in. conduits | 200 l. f. | .50 | 1.00 | 1.00 |
| 15. Set manhole frames and covers | 6 ea. | 25.00 | 20.00 | 10.00 |
| 16. Steel sheet piling, left in place | 18,000 s. f. | .80 | .50 | .25 |
| 17. Conc., bases of bascule piers | 11,400 c. y. | 14.00 | 20.00 | 16.00 |
| 18. Conc., bases of ret. walls | 4,500 c. y. | 9.00 | 6.00 | 6.00 |
| 19. Conc., bascule piers above bases except houses and steel beams. | 6,400 c. y. | 12.00 | 10.00 | 11.00 |
| 20. Conc., in houses and in slabs on steel beams | 250 c. y. | 15.00 | 23.00 | 20.00 |
| 21. Conc., retaining walls above bases | 2,500 c. y. | 14.00 | 12.00 | 13.00 |
| 22. Conc., basc. span counterweights | 290 c. y. | 12.00 | 10.00 | 9.00 |
| 23. Conc., encasement for sewers | 200 c. y. | 15.00 | 8.00 | 10.00 |
| 24. Cast iron balance blocks | 50,000 lb. | .08 | .06 | .04 |
| 25. Portland cement | 54,000 bbl. | 2.10 | 1.90 | 2.20 |
| 26. Spec. Portland cement | 300 bbl. | 3.00 | 2.75 | 2.80 |
| 27. Natural cement | 6,000 bbl. | 3.00 | 2.65 | 2.90 |
| 28. Bitum. matl. waterproofing | 2,000 gal. | .55 | .55 | .60 |
| 29. Membrane waterpr. with prot. crse. | 100 s. y. | 2.50 | 2.00 | 2.10 |
| 30. Granite facing, basc. pier shafts | 360 c. y. | 80.00 | 100.00 | 86.00 |
| 31. Granite facing for houses | 25 c. y. | 200.00 | 250.00 | 225.00 |
| 32. Reinf. bars for structures | 1,600,000 lb. | .055 | .05 | .06 |
| 33. Reinf. trusses, roadway slabs. | 30,000 lb. | .06 | .06 | .07 |
| 34. Structural steel | 1,600,000 lb. | .12 | .145 | .14 |
| 35. Cast steel floor joints | 20,000 lb. | .21 | .18 | .24 |
| 36. Miscellaneous metal | 10,000 lb. | .20 | .20 | .23 |
| 37. Roadway grating, basc. spans | 5,600 s. f. | 2.25 | 2.00 | 2.20 |
| 38. Asph. planks, sidewalks on span | 1,000 s. f. | .30 | .30 | .35 |
| 39. Clearing and grubbing | L.S. | 1,000.00 | 5,000.00 | 500.00 |
| 40. Trim shoulders and slopes | L.S. | 500.00 | 1,000.00 | 500.00 |
| 41. Prepare fine grade | 50,000 s. y. | .10 | .10 | .10 |
| 42. 12-in. vitr. tile pipe | 3,200 l. f. | 1.50 | .80 | 1.55 |
| 43. 15-in. vitr. tile pipe | 200 l. f. | 1.75 | 1.10 | 1.95 |
| 44. 18-in. vitr. tile pipe | 200 l. f. | 2.50 | 1.40 | 2.50 |
| 45. Sheet asphalt pavement | 41,000 s. y. | 1.50 | 1.50 | 1.60 |
| 46. Bitum. macadam pavement | 1,000 s. y. | 1.25 | 1.30 | 1.90 |
| 47. Granite block paving | 11,000 s. y. | 1.25 | 1.50 | 1.50 |
| 48. Concrete sidewalk | 8,500 s. y. | 1.50 | 1.60 | 1.70 |
| 49. 6-in. steel curb | 12,500 l. f. | 1.80 | 1.70 | 1.70 |
| 50. 9-in. steel curb | 800 l. f. | 2.00 | 1.80 | 1.70 |
| 51. Separate concrete curb | 100 l. f. | .75 | 1.00 | .50 |
| 52. Catch basins, type A | 32 ea. | 100.00 | 25.00 | 70.00 |
| 53. Catch basins, type B. | 2 ea. | 100.00 | 15.00 | 24.00 |
| 54. Manholes, type S | 14 ea. | 85.00 | 50.00 | 130.00 |
| 55. Alter manholes and catch basins | 40 ea. | 20.00 | 25.00 | 20.00 |
| 56. Drainage castings | 37,000 lb. | .06 | .07 | .065 |
| 57. Lay 12-in. hi. pres. water main | 180 l. f. | 1.20 | 3.00 | 1.75 |
| 58. Lay 16-in. hi. pres. water main | 1,000 l. f. | 1.25 | 3.50 | 2.00 |
| 59. Lay 8-in. water main | 1,300 l. f. | .75 | 1.25 | .90 |
| 60. Lay 12-in. water main | 100 l. f. | 1.00 | 2.50 | 1.50 |
| 61. Install 8-in. gate valves | 3 ea. | 15.00 | 20.00 | 26.00 |
| 62. Install 12-in. gate valves | 1 ea. | 25.00 | 30.00 | 29.00 |
| 63. Inst. 12-in. h. p. gate valve | 1 ea. | 30.00 | 40.00 | 47.00 |
| 64. Inst. 16-in. h. p. gate valve | 3 ea. | 35.00 | 50.00 | 50.00 |
| 65. Install hydrant assemblies | 3 ea. | 50.00 | 75.00 | 59.00 |
| 66. Inst. hi. pres. hydrant. assem. | 4 ea. | 60.00 | 100.00 | 95.00 |
| 67. Remove 8-in. water main | 1,100 l. f. | .75 | .75 | .55 |
| 68. Remove 12-in. water main | 450 l. f. | 1.00 | 1.00 | .75 |
| 69. Remove 12-in. h. p. water main | 180 l. f. | 1.25 | 2.00 | .80 |
| 70. Remove 16-in. h. p. water main | 1,000 l. f. | 1.25 | 2.00 | .90 |
| 71. Relocate fence | 500 l. f. | 15.00 | 5.00 | 1.00 |
| 72. Maintain and protect traffic | L.S. | 2,000.00 | 10,000.00 | 5,200.00 |
| 73. Barricades | 500 l. f. | 2.00 | 1.00 | 1.00 |
| 74. Broken stone, loose measure | 250 c. y. | 4.00 | 3.50 | 3.50 |
| 75. Houses on bascule piers | L.S. | 20,000.00 | 20,000.00 | 21,000.00 |
| 76. Trunnions and bearings | 40,000 lb. | .40 | .30 | .32 |
| 77. Operating machinery | 80,000 lb. | .54 | .50 | .50 |
| 78. Cranes for machinery galleries | L.S. | 2,600.00 | 2,000.00 | 2,100.00 |
| 79. Emerg. gasoline engines | L.S. | 5,600.00 | 1,000.00 | 2,100.00 |
| 80. Electr. equip., basc. spans | L.S. | 55,000.00 | 75,000.00 | 60,000.00 |
| 81. Barrier gates | L.S. | 45,000.00 | 35,000.00 | 35,000.00 |
| 82. Bridge operator | L.S. | 500.00 | 1,000.00 | 500.00 |

## TUNNEL LINING, MONTANA

OWNER: Public Roads Administration, Portland, Ore.; W. H. Lynch, district engineer.

PROJECT: Tunnel lining work in connection with Transmountain Highway, East Side project, in Glacier National Park, Glacier County, Montana. Involves structure excavation, tunnel excavation (trimming), paving, grouting, and concrete structures. Drainage facilities are also included.

CONDITIONS: Rail and highway transportation facilities available. A portion of the work is to be done by government forces, and balance by contractor. Wage rates stipulated are: skilled labor, $1.20 to $1.50 per hr.; semi-skilled, 75c. to $1.20; common, 65 to 75c.

BIDS: Seven bids were opened January 8, 1941, ranging from the low of $57,990 to $86,730.

LIST OF BIDDERS:

1. Elmer Genger & Son, Fairfield, Mont. (contract) ..... $57,990
2. Colonial Constr. Co., Spokane, Wash. ..... 62,176
3. Barnard-Curtiss Co., Minneapolis, Minn. ..... 64,034

| Item | Quan. | Unit Prices (1) | (2) | (3) |
|---|---|---|---|---|
| 1. Required force account work | L.S. | $2,000.00 | $2,000.00 | $2,000.00 |
| 2. Unclass. excavation, structures | 350 c. y. | 5.00 | 4.00 | 3.00 |
| 3. Tunnel excavation (trimming) | L.S. | 2,500.00 | 9,500.00 | 14,500.00 |
| 4. Salvaged surfacing | 70 c. y. | 2.00 | 1.00 | 3.00 |
| 5. Remove, dispose exist. pavmt | 1,100 s. y. | 1.00 | .40 | .50 |
| 6. Concrete pavement | 1,000 s. y. | 4.35 | 3.50 | 3.85 |
| 7. Class D. concrete | 1,000 c. y. | 38.40 | 35.00 | 33.50 |
| 8. Reinforcing steel | 50,000 lb. | .07 | .07 | .07 |
| 9. Drill grout holes | 500 l. f. | 1.50 | 1.50 | 1.50 |
| 10. Grout | 1,500 c. f. | 1.50 | 3.00 | 1.75 |
| 11. Structural steel | 1,200 lb. | .15 | .25 | .25 |
| 12. Cl. A cem. stone masonry (walls, rail, spec. mas.) | 10 c. y. | 30.00 | 50.00 | 45.00 |
| 13. Class A cem. stone masonry (portals) | 10 c. y. | 50.00 | 50.00 | 50.00 |
| 14. Std. rein. conc. culv. pipe, 12-in. | 24 l. f. | 5.00 | 4.00 | 3.50 |
| 15. 18-in. bit. coated corr. s. m. pipe, type 1 | 30 l. f. | 5.00 | 4.00 | 5.50 |

# CONSTRUCTION REPORTS

*Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York*
*ELSIE EAVES, Manager* *SCOTT McLEOD, Statistician*
(Daily service also available—Write for details)

*Location of ENR Correspondents*

*Symbols and Abbreviations Include:*

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

*Projects—By Size*

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

*Classes of Construction*

(Named in order of Listing)

| | |
|---|---|
| Water Supply | Unclassified |
| Sewers, Waste Disposal | Latin America |
| Bridges, Grade Cross'gs | Public Buildings |
| Streets & Roads | Commercial Buildings |
| Earthwork, Waterways | Industrial Buildings |

*Stages Reported*

PROPOSED: (except Streets & Roads):

BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);

LOW BIDDERS: All low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

## WATER SUPPLY

### PROPOSED WORK

**Calif., Kingsburg** — Voted $33,000 bonds, exten. WW and sewerage sys. CD 1/2—ENR 1/9.

**Calif., Modesto**—Rock Creek Water Dist., Modesto, authorized by Supervs. Stanislaus Co., to call election for formation of district to finance construction water storage sys. $25,000 or more.

**Conn., Hartford**—Metropolitan Dist. Comn., Water Bureau, C. A. Goodwin, chn. Dist. Comn., 550 Main St., filtration plant exten., Farmington Ave. Reservoir, incl. filter beds, pipe lines, etc., West Hartford. Over $15,000. C. M. Saville, c/o Water Bureau, dist. Comn., engr.

**Ill., Carpentersville**—Village, iron removal installation. Over $15,000. V. Kasser, City Hall Bldg., Elgin, engr.

**Ill., Menard** — State Dpt. Public Welfare, water softening and chemical feeding equip., etc., for Illinois State Penitentiary. Div. Architecture & Eng., Armory Bldg., Springfield, archt. and engr.

**†Ind., North Madison**—War Dpt., 20 St. and Constitution Ave. N.W., Wash., D. C., water supply sys. for Proving Grounds, with deep water wells, mains and power pump to pump water uphill. $175,000 or more with equip.

**La., Bogalusa**—Exten. water and sewer facilities. $326,000. Taxpayers to vote on project in special election Mar. 11.

**Mass., Ashland**—Bd. Selectmen, Town Hall, standpipe, water sys. imprvs., steel water storage tank. $15,000.

**Mass., Danvers**—Water Dpt., Town Hall, preliminary plans filtration plant, facilities. Over $15,000. CD 2/6/40—ENR 2/8/40.

**Mich., Ecorse**—Ecorse Twp., WW distr. sys. incl c.i. pipe specials. $110,000. M. L. Brown & Son, 120 Madison Ave., Detroit, engr.

**Mo., Maryland Heights (St. Louis Co.)**—Maryland Heights Water Dist. 2 of St. Louis Co., c/o G. Boden, Lansing Ave., south of Carlson, et al, comrs., $25,000 bond election Feb. 25, water distr. sys., within district centering around Fee Fee and Dorsett Rd., south of Creve Coeur Lake car line. $45,000. Will seek WPA gr. Robert Francis Denny Co., 8004 Bonhomme St., Clayton, St. Louis, engrs. CD 10/16—ENR 10/24.

**Mo., Waynesville** — City Clerk, WW and distr. sys. $46,404. Russell & Axon, 4903 Delmar Blvd., St. Louis, archts. Seeking WPA funds.

**Neb., Verdon**—$13,000 bond election Apr. 1, WW imprv. $30,000. CD 2/11.

**Mont., Helena**—V. N. Kessler, city clk., bids soon, 20,000 ft. 24 in. watermain. $20,000. CD 8/28—ENR 9/5.

**Neb., Omaha** — Metropolitan Utilities Dist., main repairs and relocation fire hydrants, lower water mains. $30,000.

**N. C., Elon**—Voted $15,000 bonds, water and sewer imprvs. $80,000. J. B. Long, mayor.

**Okla., Oklahoma City**—New 5 mi. 6 in. c.i. watermain to serve new airport near Bethany, $45,000. R. Lee, City Hall, engr.

**Pa., Titusville**—Exten. c.i. watermains, service lines, meters, connections, etc., to site of federal defense housing project. $15,000-$20,000. J. M. Fay, city engr.

**Pa., Williamsport**—Williamsport Water Co., 253 W. 4 St., exten. c.i. watermains, service lines, etc., to site of 250 unit federal defense housing project. Over $15,000.

**Tex., Harlingen**—H. Ramsey, mayor, 3½ mi. watermains to connect with Govt. Air Training Base and other appurtenances. $18,000.

**Tex., Houston**—E. M. Peckett, mayor, plans completed exten. and watermain addns. $150,000. G. L. Fugate, City Hall, engr.

**Tex., Lubbock**—Voted bonds WW imprvs., $75,000. H. N. Roberts, Lubbock, engr.

**Tex., San Antonio**—City Water Bd., 208 W. Market St., W. D. Masterson, mgr., 250,000 gal. steel elevated tank and 100 ft. tower off Austin Rd., laying 2 mi. 12 or 16 in. c.i. main, $60,000.

**Wash., Longview**—Rejected bids Feb. 6, water filter plant. Over $15,000. O. C. Schoenwerk, 3240 N. Lake Shore Dr., Chicago, Ill., engr. CD 1/20—ENR 1/23.

**Wash., Monroe**—Water and sewer lines, sewage treatment plant, $100,000. Seeking WPA funds. Parker & Hill, Smith Tower, Seattle, engr.

**Wis., Waupun**—Albert Hoeft, Jr., clk., concrete water reservoir, 88 ft. diam., 11 ft. high, 1,000 g.p.m. centrifugal pumps. $20,000.

### BIDS ASKED

*Bids Asked February 27*

**Wis., Manitowoc**—Public Utilities Comn., 817 Franklin St., watermain under river at 9 St. $25,000. E. Walter, Manitowoc, city engr.

*Bids Asked March 3*

**N. C., Burlington**—E. B. Horner, mayor, 1½ m.g., elevated, steel water tank. $135,000. The Linberg Engineers, Burlington, engrs. CD 1/2—ENR 1/9.

*Bids Asked March 5*

**Fla., Miami**—L. L. Lee, city mgr., 16 in. c.i. watermain in S.W. 32 Ave. from F. E. C. Ry., and connecting to existing 8 in. c.i. watermain in Day Ave.

*Bids Asked March 11*

**La., Mansfield**—At office of W. E. Town, mayor, water pipe line exten., reservoirs, natural gas engine generator installation, 1,000 gpm service pump, waterworks building, and combination fire station and municipal building. J. B. McCrary Co., Inc., 22 Marietta St. Bl., Atlanta, Ga., engrs.

*Bids Asked March 18*

**La., Jennings**—At office Hon. L. T. Moses, mayor, 2 story, 41x47 ft. water purification plant complete with all equip. V. Smith, Jennings, engr. CD 11/13—ENR 11/21.

*Bids Asked March 19*

**N. Y., St. George**—Office Dpt. Mental Hygiene, State Office Bldg., Albany, W. J. Tiffany, comr., water supply, sewers and water lines, New York State School for Mental Defectives, Willowbrook, near here. $359,152; adv. ENRR 2/20.

### LOW BIDDERS

**N. C., Fayetteville**—P. Wks. Comn., J. F. Burgess, chn., Feb. 6, 1 m.g., elevated, steel tank on steel tower, from Chicago Bridge & Iron Wks., 37 W. VanBuren St., Chicago, Ill. $77,000. CD 1/28—ENR 1/30.

### CONTRACTS AWARDED

**Calif., Oakland**—Directors East Bay Municipal Utility Dist., 512-16 St., Pleasant Hill, water distr. sys., LS 258, to A. Granaotta, P. O. Box 224, Walnut Creek. $36,422. Former contract rescinded. Bids 1/22. CD 1/23—ENR 2/6, under LB.

**†Ga., Atlanta**—Con. Q. M., water lines, to S. B. Slack, 455 Clairmont Ave., Decatur. $59,994. Bids 1/24, awarded 1/29.

**Miss., Meridian**—J. T. Pinkston, WW comr., WW plant addn., new 18x35 ft. concrete pumphouse building, to L. W. Hancock, Asylum Heights, Meridian. Est. $27,000. L. W. Duffie, WPA Bldg., engr. for 4 Dist., Laurel.

**†Mo., Rolla**—War Dpt., 20 St. and Constitution Ave. N.W., Wash., D. C., filtration and purifying sys., Fort Leonard Wood, to E. W. Bacharach & Co., Rialto Bldg., Kansas City. $43,000.

**Neb., Fremont**—imprv., exten. water and sewerage sys. WPA. $148,358. L. M. Roessler, city engr.

**N. Y., Granville**—Imprv. WW sys., additional mains, pumphouse, etc. WPA. $40,000. C. L. Post, Old P. O. Bldg., Albany, ch. engr. WPA projects.

**N. Y., Lakewood**—E. Eckman, mayor, additional c.i. watermains, hydrants, service connections, etc., in outlying districts, own forces. $15,000. Hill & Hill, 24½ Main St., North East, engrs. CD 1/28—ENR 1/30.

**O., Athens**—400,000 gal. water reservoir. WPA. $46,000. CD 1/17—ENR 1/23.

**Pa., Sellersville**—Boro Council, R. Stackel, pres., WW sys. exten., own forces. Est. $27,000-$30,000. Boro Eng. Dpt., c/o owner, engrs. CD 2/7—ENR 2/13.

**Tenn., Medina** — New WW sys. WPA. $35,000.

**Tex., Jacksonville**—T. E. Acker, mayor, imprv. existing WW sys., raising dam and spillway 3½ ft., laying 1½ mi. 8 in. main, 200,000 gal. steel water tower, filtration imprvs. WPA. $112,000. CD 2/20/40—ENR 2/22.

**Tex., Seguin**—WW sys. imprvs., additional distr. lines, c.i. pipe, concrete reservoir, pump, plant imprvs., WPA. $73,216. CD 10/30—ENR 11/7.

## SEWERS, WASTE DISPOSAL

### PROPOSED WORK.

★**Calif., North Sacramento (br. Sacramento)**—Hagginwood Sanitary Dist., $200,000 bond election Feb. 25, sewerage sys. $600,000. CD 1/28—ENR 1/30.

**Fla., Gulfport**—F. O. Lee, dir. P. Wks., second sewage disposal plant, West side. Over $25,000.

**Fla., Marianna**—Sewers. Over $25,000. To vote on project Mar. 4.

**Ill., Freeburg**—Activated sludge mechanical earation treatment works, WPA. W. R. McCaslin, Nokomis, engr.

**Kan., Emporia**—E. T. Mendel, city clk., sewage disposal plant. $75,000. R. W. Cunningham, city engr.

**†Me., Kittery**—Yards & Docks, Navy Dpt., Wash., D. C., completing plans sewerage and water sys. for housing development, Spec. 10258.

**Minn., Chisholm**—P. Khrin, city genl. chn., sewage disposal plant.

**Minn., Cokato**—A. M. Anderson, village recdr., sewage disposal plant, intercepting sewers. Toltz, King, & King, 1509 Pioneer Bldg., St. Paul, engrs.

**Minn., Red Wing**—S. T. Irvine, city clk., sewage disposal plant, interceptor sewer. $200,000. M. E. Chamberlain, Montevideo, engr.

**Mo., Carsonville (St. Louis P. O.)**—Carsonville Sewer Dist. of St. Louis, c/o H. Shifrin, engr., International Office Bldg., St. Louis, voted $70,000 bonds, sanitary sewerage sys., disposal plant. $280,000. Seeking $210,000 WPA gr. CD 1/31—ENR 2/6.

**Mont., Billings**—O. W. Nickey, city clk., surveys sewage disposal plant, $75,000. Black & Veatch, 4706 Bway., Kansas City, Mo., engr. CD 11/28—ENR 12/5.

**Neb., Norfolk**—A. O. Hazen, city clk., new sewage disposal plant, $50,000. Will apply to WPA.

**Neb., Scottsbluff**—H. E. Brown, city clk., $50,000 bond election Apr. 1., storm sewers. $100,000. CD 1/28—ENR 1/30.